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## APPROXIMATE TRAJECTORY DATA FOR MISSIONS TO THE MAJOR PLANETS

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# APPROXIMATE TRAJECTORY DATA FOR MISSIONS TO THE MAJOR PLANETS

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## SUMMARY

Impulsive velocity increment ( $\Delta V$ ) requirements for one-way trajectories from low-Earth orbit to the major planets are presented in the form of contour charts and tables. The given Earth-to-planet data also apply to return transfers, thereby permitting round trips to be analyzed. The charts relate propulsive effort to departure and arrival dates, travel times, and planetary configurations; they are designed for rapid identification of efficient mission trajectories. The tabular presentation includes hyperbolic speeds and a summary of orbit elements and geometry.

These basic data are applied to several major-planet missions. The sample trajectories illustrate the applicability of the data and the methods of using them.

For one-way flyby missions it was found that near minimum  $\Delta V$ 's in the 8 kilometer per second range are required for travel times ranging from 1.1 years (to Jupiter) to 16 years (to Neptune). An additional  $\Delta V$  of about 1 kilometer per second in most cases is sufficient to bring the vehicle into a highly elliptical parking orbit (compared to 7 to 22 km/sec  $\Delta V$  to enter a low circular parking orbit).

For each planet, a family of symmetric nonstop round-trip trajectories based on a nonpropulsive gravity turn maneuver was constructed. The minimum  $\Delta V$ 's were again in the 8 kilometer per second range; however, these missions required 2.5 to 30 year trip times.

For elliptic-orbiting round trips, minimum total  $\Delta V$ 's were in the 11 kilometer per second range, which is comparable to the total  $\Delta V$  for Mars and Venus missions. This minimum occurs at roughly one-half of Hohmann time.

Data are presented to enable the reader to construct interlunar excursion mission studies for the moons of the major planets. An upper limit on time required for these missions is determined by assuming the worst possible configuration for the moons. For an example mission to Saturn's four largest moons, the total  $\Delta V$  for the interlunar exploration varied from 18.4 to 20.7 kilometers per second depending on whether or not elliptic orbits were used about each moon.

## INTRODUCTION

In view of recent Apollo and Mariner Mars and Venus accomplishments, it is perhaps appropriate to consider possible next steps in interplanetary flight. Present plans include more manned trips to the Moon and more probes to Mars and Venus. In the more distant future, manned trips to Mars and Venus may be considered.

There is also scientific interest in the major planets Jupiter, Saturn, Uranus, and Neptune as indicated in reference 1. These planets differ markedly from the four inner or "terrestrial" planets in size and physical characteristics. Moreover, the major planets possess extensive lunar systems which may offer suitable conditions for manned landings.

Except for special situations like grand tours (ref. 2) in the late 1970's, missions to the major planets tend to be very difficult in terms of  $\Delta V$  and/or trip time requirements; hence, some type of "advanced" propulsion system (e.g., electric propulsion and/or nuclear rockets) may be desirable or even necessary. Some general comparisons of the various advanced concepts have been made (ref. 3). However, to clearly define regions of advantage for each of the several competing systems a large amount of trajectory data suitable for preliminary mission analysis must be acquired. The data required at this stage need not be highly precise, but they should cover a wide range and be presented so that all reasonable combinations of mission destinations, objectives, and trajectory profiles can be studied conveniently and on a consistent basis.

Detailed impulsive thrust results have been recently published (refs. 2 and 4 to 7) for one-way trajectories to the major planets, both direct and using a Jupiter swingby. The data presented in these reports were computed using a fairly detailed trajectory model (inclined elliptic planet orbits, etc.) and apply to the time period 1976 to 1986. However, they do not report return trajectories (planet to Earth) or trajectories between the moons of the major planets. Hence, the data now available may not include the time period of interest for advanced missions; in any case, they do not include lunar trajectories or the return transfers for round trips.

The present report, although based on a less precise solar system model (circular-coplanar planet orbits), includes an extensive compilation of ballistic Earth-to-planet, planet-to-Earth, and interlunar trajectories. Because of the simplified solar system model employed, these data apply equally in all synodic periods. In terms of propulsive effort, the resultant errors are not large (ref. 8) and are insignificant compared to the uncertainties involved in estimating the performance of hypothetical rocket propulsion concepts.

The only known prior work dealing with major-planet round trips and interlunar trajectories (refs. 8 and 9, respectively) concerned Jupiter only and were primarily of an illustrative nature. The present report extends the work of references 8 and 9 to in-

clude the other major planets and provides "working" data to support further mission studies.

To facilitate comparison between high and low thrust systems, the present data (which apply to a high-thrust system only) were computed using the same planetary constants and basic assumptions as in reference 10. (The latter presents a wide range of low-variable-thrust data for missions to all planets.)

One-way trajectories beginning and ending in a low circular parking orbit are first studied for each planet, using the successive two-body trajectory model, impulsive thrust, and circular, coplanar planet orbits. Travel times ranging from about 20 percent of to full Hohmann time are considered. The basic trajectory data are presented in the form of contour charts relating propulsive effort ( $\Delta V$ ) to travel time, departure and arrival dates, and other basic trajectory characteristics. These charts are supplemented by a tabular presentation of further trajectory data which is sufficiently detailed to support preliminary mission calculations.

The one-way trajectory data are assembled into round trips on the basis that the planetocentric parking orbit, together with its associated capture and escape maneuvers, must match the outbound and return trajectories at the "sphere of influence." Planetary stay times of 0 to 400 days are also considered. An attractive family of round trips with minimum or near minimum total  $\Delta V$  requirements at roughly half of the Hohmann trip times is identified for each planet.

The interlunar and parking orbit to moon trajectories are finally considered. Total  $\Delta V$  and maximum travel times are presented for trajectories consisting of a sequence of Hohmann transfers which leads from the planet parking orbit to a moon and from one moon to another. The space vehicle may orbit or fly by as many as four of the largest moons before returning to the parking orbit.

## ONE-WAY TRAJECTORIES

### Interplanetary Analysis

An interplanetary mission as used herein consists of as many as four essential phases: an outbound transfer from Earth to the target planet, a parking orbit at the target planet if an orbiter, interlunar exploration if desired, and a return transfer to Earth if a round trip.

In this section, methods of solving the one-way mission problem are outlined for flyby and orbiter missions. In a later section, methods are described for determining round-trip missions using one-way data.

For a total trip time ( $T_T$ ) and a stay time ( $T_S$ ) at the destination planet, minimum impulsive requirements ( $\Delta V$ ) for each of the mission phases are determined.

In table I are summarized the assumed actual orbit and physical properties for Earth, Jupiter, Saturn, Uranus, and Neptune (refs. 6 and 7) and the mean values used in this two-dimensional circular orbit analysis.

Outbound transfer. - The outbound interplanetary transfer consists of three parts: an escape from Earth (fig. 1), the heliocentric transfer (fig. 2), and the capture by the target planet (fig. 3). Several approximations are made. First, the planetary orbits are assumed to be circular and coplanar. Second, the sizes of the planetary spheres of influence are assumed to be negligible when compared to interplanetary distances but much larger than the parking orbit dimensions. Inside the sphere of influence, only the planet's gravitational field is considered; outside the sphere of influence, only the Sun's field is considered. This analysis then is based on the impulsive two-body trajectory model. Propulsive maneuvers are treated as impulses and the actual N-body problem is replaced by a sequence of planet- and Sun-centered conic sections matched at the sphere of influence. Also, the arrival or departure hyperbolic excess velocity vector may be located at any position on the sphere of influence. Because of the large distances involved, the low eccentricities, and the low inclinations of these planets, these assumptions do not produce major errors in the results. Reference 8 using a similar procedure cites errors of less than 5 percent in the total  $\Delta V \left( \sum_1^4 \Delta V \right)$  for Earth-Jupiter round-trip trajectories.

During the escape maneuver in the vicinity of Earth, vehicular motion is described in geocentric coordinates (fig. 1). The vehicle is assumed to depart from a 1.1 Earth radii circular orbit upon the application of an impulsive velocity increment  $\Delta V_1$ . The escape path from Earth is a hyperbola and the vehicle is assumed to cross the Earth's sphere of influence with a hyperbolic excess velocity ( $V_\infty$ ) oriented along the asymptote of the hyperbola specified by the angle  $\varphi_\infty$ .

Upon leaving the sphere of influence, the Sun's gravitational attraction becomes dominant and vehicular motion is a conic section described in heliocentric coordinates. The trajectory velocity ( $V_{H, \oplus}$ ) at the Earth end on this conic section between Earth and the destination planet is the vector sum of  $V_\infty$  and of the orbital velocity of the Earth about the Sun ( $V_\oplus$ ). The  $V_{H, \oplus}$  is oriented at a path angle  $\alpha$  with respect to the local horizontal relative to the Sun.

While in heliocentric space (fig. 2) the vehicle traverses a heliocentric travel angle  $\beta_O$  in an outbound travel time  $T_O$ . Once each synodic period the Earth and the target planet are in opposition. The launch date may be specified as the amount of time before the next opposition  $T_D$ , and the arrival date as the time between that opposition and the vehicle's encounter with the target planet  $T_A$ . Thus, the outbound travel time becomes the sum of  $T_D$  and  $T_A$ :

$$T_O = T_D + T_A \quad (1)$$

The relative position of the two planets is further specified by the configuration angle  $\gamma$ . Missions can be specified for any time in the future by describing the trajectory in terms of these parameters and recalling that circular coplanar orbits have been assumed.

The final portion of the outbound trajectory is encounter with the target planet (fig. 3). Once the vehicle enters the sphere of influence  $r_{\infty, p}$  the trajectory is again described in planetocentric coordinates. The vehicle approaches the planet with a heliocentric trajectory velocity  $V_{H, p}$  at a path angle  $\alpha$  with the local horizontal to the planet-Sun line. The arrival hyperbolic excess velocity  $V_{\infty, p}$  is the vector difference of  $V_{H, p}$  and the planet's orbital velocity about the Sun. The vehicle is then considered to follow a hyperbolic orbit having an asymptote angle  $\varphi_{\infty}$  measured from planet-Sun line.

Computational procedure. - The computational procedure followed is a simplified version of that used in reference 11. In general, the calculations are made as follows:

- (1) A transfer time and launch date or heliocentric travel angle of a trajectory are specified.
- (2) From the previous information and planetary orbital data, the position and motion of Earth when the vehicle departs and of the planet when the vehicle arrives are known.
- (3) The elements of the transfer trajectory which connects Earth and the target planet in a specified travel time are found by an iteration process and the associated velocity increments are calculated.

### Target Planet Maneuver Analysis

Assumptions. - The final phase of the one-way mission is the encounter with the target planet. The principal assumptions made in the analysis of this encounter are the following:

- (1) The planet is treated as a point mass and is nonoblate.
- (2) All maneuvers are made impulsively.
- (3) The minimum radius consistent with avoiding atmospheric effects is 1.1 times the planet's equatorial radius.
- (4) Flyby maneuvers and initial parking orbits are in the plane of the arrival and departure hyperbolic velocity vectors ( $\vec{V}_{\infty, 2}$  and  $\vec{V}_{\infty, 3}$ ) and the planet.

Flybys. - The flyby maneuver is a nonstop planetary encounter. It is the simplest type of interplanetary probe and is of interest because of the relatively low  $\Delta V$  requirements. The vehicle enters the planet's sphere of influence from a heliocentric trajectory

with a known hyperbolic excess velocity ( $V_{\infty, 2}$ ). Within the sphere of influence, the gravitational field of the planet deflects the vehicle from its original heliocentric heading. The vehicle then departs on a different heading with the same hyperbolic excess velocity as it had on arrival.

Four types of flyby trajectories are shown in figure 4. Four velocity vectors are indicated on each part of this figure. Two are the hyperbolic velocity  $\vec{V}_{\infty, 2}$  and  $\vec{V}_{\infty, 3}$  equal in magnitude but not in direction. The others are the heliocentric velocity of the planet  $\vec{V}_p$  and the heliocentric velocity of the vehicle  $\vec{V}_{H, p}$ . Note that  $\vec{V}_{\infty}$  is the vector difference of  $\vec{V}_p$  and  $\vec{V}_{H, p}$ .

In figures 4(a) and (b), the vehicle has approached the planet while heading away from the Sun. In figure 4(a), the vehicle passes in front of the planet, is turned by the gravitational pull, and if passage is close enough may head back towards the Sun (and Earth). This results in a dark side (periapsis away from the Sun) retrograde passage. In figure 4(b), the vehicle passes behind the planet and its path is bent in a manner causing it to continue away from the Sun. This is a twilight (periapsis near the terminator) posigrade passage.

In figures 4(c) and (d), the vehicle has approached the planet while heading toward the Sun. As seen in figure 4(c), an approach in front of the planet results in a Sun-side (periapsis towards the Sun) posigrade passage, and the vehicle then may head away from the Sun. If instead, the vehicle passed behind the planet, it would experience a twilight retrograde passage and then head in toward the Sun.

For a Hohmann trajectory, the vehicle would approach the planet's orbit tangentially, and would then head either toward or away from the Sun depending on whether it passes on the dark side or the light side of the planet, respectively.

Orbiting trips. - Gravity turn flybys are simple and can be accomplished for moderate  $\sum \Delta V$ 's. However, they provide only limited opportunity for observing the target planet. In order to accomplish more extensive observations it is necessary to enter a parking orbit about the target planet. One possible orbit is a low circular parking orbit (at 1.1 planet radii) (see fig. 5(a)). This has several advantages:

- (1) It offers frequent opportunities for launch onto the Earth return trajectory in the case of a round trip.
- (2) It provides low altitude observation of the planet.
- (3) For a given deorbit  $\Delta V$  it has the lowest possible atmospheric entry velocity for a landing when that is planned.

Shown in figure 5(a) is the incoming hyperbolic excess velocity  $V_{\infty, 2}$ . The turning angle  $\delta_2$  between  $V_{\infty, 2}$  and the circular parking orbit at 1.1 planet radii is supplied by the planet's gravitational field. Orbital capture is accomplished by an impulsive velocity increment  $\Delta V_2$ .

Generally, the  $\Delta V_2$  required to enter the circular parking orbit is uncomfortably high, but as will be shown, it can be significantly reduced by using an elliptic orbit instead. This type of parking orbit is shown in figure 5(b). An impulsive velocity increment  $\Delta V_2$  is applied at periapsis of the approach hyperbola. The line of apsides of the parking ellipse is not generally along the planet-Sun line.

### Presentation of Data

Basic trajectory data are presented in a graphical format relating velocity increment requirements to several useful mission parameters. These parameters include (1) travel time, (2) heliocentric travel angle, and (3) departure and arrival dates.

The relative positions of departure and arrival for one-way outbound trips are represented in the construction of the figures. The results, however, can be applied for round-trip missions. The mission configuration is fixed by designating departure and arrival dates with reference to an opposition between Earth and the target planet. This concept is illustrated in figure 6 where it can be seen that the heliocentric travel angle is

$$\beta_O = T_D \omega_{\oplus} - T_D \omega_p + T_O \omega_p \quad (2)$$

The outbound travel time is equal to the sum of the travel time from departure to the reference opposition, plus the travel time from the reference opposition to arrival:

$$T_O = T_D + T_A \quad (3)$$

Thus, the time to arrival is

$$T_A = \frac{1}{\omega_{\oplus} - \omega_p} (\omega_{\oplus} T_O - \beta_O) \quad (4)$$

This relation sets forth the general arrangement of the graphical data (figs. 7 to 10). Time to arrival is plotted against heliocentric travel angle for various travel times. This produces a series of parallel, negatively sloped straight lines characterized by different travel times. Lines of constant one-way velocity increment requirements for 1.1 circular parking orbit to 1.1 circular parking orbit  $\sum_1^2 \Delta V$  are constructed on this grid. A set of contours centered about the Hohmann minimum energy transfer trajectory

point result (see fig. 7). The locus of minimum  $\sum_1^2 \Delta V$  for a given trip time is a line of rapidly increasing slope starting at the origin and passing steeply through the Hohmann transfer point at  $\beta_O = 180^\circ$ . This line defines trips with optimum travel angle for a given travel time.

Departure dates are plotted as times before the reference opposition according to the relation

$$T_D = \frac{1}{\omega_\oplus} \beta_O - \frac{\omega_p}{\omega_\oplus} T_A \quad (5)$$

and appear as positively sloped straight lines of different departure times.

For convenience, another vertical scale has been added to the figures. This scale shows the configuration angle  $\gamma$  between Earth and the target planet on arrival date. The angle  $\gamma$  will vary from  $0^\circ$  to  $360^\circ$  in a synodic period. The arrival date configuration angle is related to the other trajectory parameters by

$$\gamma = \beta_O - (\omega_\oplus T_O - 360^\circ N) \quad (6)$$

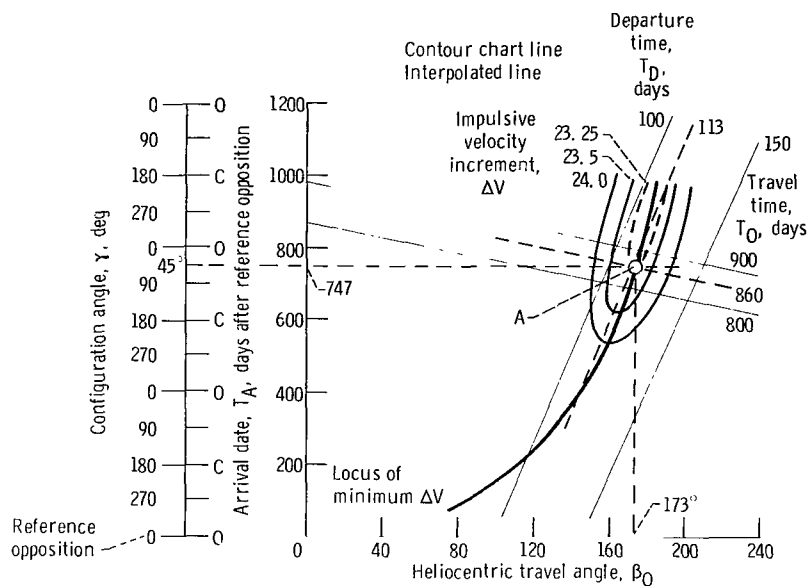
where the minimum value of  $N$  (an integer) is used for which  $\gamma$  is positive. If the planets at arrival are in opposition, the configuration angle is  $0^\circ$  or  $360^\circ$ . Likewise, a configuration angle of  $180^\circ$  means that the planets are in conjunction at arrival.

Basic trajectory parameters are easily determined from the  $\Delta V$  contour charts (figs. 7 to 10) for either one-way or round-trip missions. Any two of the following factors may be specified as independent variables defining from the charts the other five:

(1) travel time, (2) desire for minimum  $\sum_1^2 \Delta V$  operation, (3)  $\sum_1^2 \Delta V$ , (4) heliocentric travel angle, (5) departure date, (6) arrival date, (7) configuration angle at arrival.

Use of charts and data for one-way missions. - Of greatest interest for one-way missions is the minimum  $\sum_1^2 \Delta V$  trajectory for a given travel time. Therefore, a point may be found anywhere on the line of minimum  $\sum_1^2 \Delta V$  drawn on the chart, corresponding to the travel time selected. Point A in figure 7 and sketch (a) is the minimum  $\sum_1^2 \Delta V$  trajectory for an 860-day trip to Jupiter. The approximate required  $\Delta V$  is 23.25 kilometers per second and the heliocentric travel angle is  $173^\circ$ . The departure date is estimated to be 113 days before the next Earth-Jupiter opposition. The vertical scale to the left indicates an arrival date of 747 days after the reference opposition (note:  $T_O = T_D + T_A$ ). The configuration angle at arrival is seen to be  $45^\circ$  as read from the





(a) - Interpolation of trajectory parameters from impulsive velocity increment  $\Delta V$  contour chart of Jupiter trips. (Opposition angle,  $O$ ,  $0^\circ$ ; conjunction angle,  $C$ ,  $180^\circ$ .)

scale on the left side. Looking at a configuration angle of  $0^\circ$ , the planets would be in opposition if the time of arrival was 797 days. But since  $T_A$  is 747 days, the vehicle arrived 50 days before the next Earth-planet opposition.

Tabular data. - In addition, more detailed data are available from tables XI to XIV. The information is arranged in columnar groupings. The table headings are defined in the appendix. The time of arrival dates are presented at the extreme left of each page. The top figure is the number of days from the reference opposition to arrival. The figure underneath is the number of days before the next subsequent opposition. The next two columns give one-way travel time in 10-day intervals and corresponding  $\sum_1^2 \Delta V$  requirements (note the minimum  $\sum_1^2 \Delta V$  in each grouping). The remaining columns are divided into three sections comprising (reading from left to right) three columns of parameters related to the arrival operation, seven columns related to the heliocentric phase, and three columns related to Earth departure operation. The column headings are defined in the appendix.

In table XI for Jupiter it is seen that the trajectory previously discussed, namely, 860 days having an arrival date at Jupiter 747 days after the reference opposition (50 days before the second subsequent opposition), can be found. When checking the "DVSUM" column for 860-day trips at other values of  $T_A$  it is also noted that this is indeed a near-

minimum  $\Delta V$  trajectory. From this point on only minimum energy trips (optimum travel angle) are discussed (dark line in figs. 7 to 10).

One-way missions. - As previously mentioned, flyby missions require the least  $\Delta V$  of all interplanetary probes since there is no  $\Delta V$  at planet arrival. Minimum  $\Delta V$  for flybys is shown in figures 11 to 14 for Jupiter, Saturn, Uranus, and Neptune, respectively. These  $\Delta V$ 's were determined by finding the minimum  $\Delta V_1$  for a given travel time. The data necessary to do this can be found in tables XI to XIV. If figure 15 is referred to, post-encounter conditions for the vehicle can be found by letting  $R$  go to infinity in the conic section formula

$$R = \frac{P}{1 + e \cos (180 - \theta_{\infty, 3})} \rightarrow \infty \quad (7)$$

or

$$\cos \theta_{\infty, 3} = \frac{1}{e} \quad (8)$$

The  $\Delta V$  necessary to establish a parking orbit can be expressed as

$$\Delta V = V_C \left[ \sqrt{\left(\frac{V_{\infty}}{V_C}\right)^2 + 2} - \sqrt{1 + e_p} \right] \quad (9)$$

For a flyby  $\Delta V = 0$ ,  $V_C$  = circular velocity at 1.1 planet radii, and  $V_{\infty}$  can be found in tables XI to XIV. Thus,

$$e = 1 + \left(\frac{V_{\infty}}{V_C}\right)^2 \quad (10)$$

$$\theta_{\infty, 2} = \theta_{\infty, 3} = \cos^{-1} \left[ \frac{1}{1 + \left(\frac{V_{\infty}}{V_C}\right)^2} \right] \quad (11)$$

and  $\varphi_{\infty, 2}$  can be found from tables XI to XIV. Therefore, the angle  $\epsilon$  between the planet-Sun line and the line of apsides of the flyby hyperbola can be expressed as

$$\epsilon = \varphi_{\infty, 2} - \theta_{\infty, 2} \quad (12)$$

As previously mentioned, the use of elliptic rather than circular parking orbits can significantly reduce the energy requirements for stopping over at the target planet. This can be seen from equation (9). Savings up to  $(\sqrt{2} - 1)V_C$  are achievable ( $e_p < 1$ ) for capture into a highly elliptical parking orbit. From the same data used to determine the flyby  $\Delta V$  requirements, 25, 50, and 100 day elliptical parking orbits having 1.1 planet radii periapsis  $\sum_1^2 \Delta V$  requirements were found. These results as well as the  $\sum_1^2 \Delta V$  requirements for circular parking orbits are also shown in figures 11 to 14. As can be seen from the figures, the curves rapidly flatten out with trip time. Thus travel time may be significantly reduced below Hohmann transfer time with only a small increase in  $\sum_1^2 \Delta V$ .

As expected, flybys require the least  $\Delta V$  and elliptic orbits show significant improvements over circular parking orbits. In addition, it should also be noted that the effect of elliptic orbital period time is small in this range (25 to 100 days).

## ROUND-TRIP TRAJECTORIES

The outbound and return legs of a round-trip mission are similar. Compare figures 6 and 16; for equal travel times and travel angles, the outbound and return trajectories are symmetrical about the opposition line. The  $\Delta V$  contour charts may be used in much the same manner as previously described if it is recognized that some of their features now have "mirror image" meanings. The following changes are to be made in determining the return leg trajectory when using point A in figure 7 as an example of a typical data point:

(1) For the outbound trip, the reference opposition was the first opposition after launch (at point A, the vehicle was launched 113 days ( $T_D$ ) prior to the reference opposition); for return trips, it is the last opposition before return (arrival data at Earth is 113 days after this opposition).

(2) The  $T_D$  instead of indicating time of launch date before the reference opposition now indicates the time from that reference opposition until return.

(3) The  $T_A$  instead of indicating arrival date in days past the reference opposition (747 days for point A) now indicates the time of departure in days before the reference opposition will occur.

(4) Travel time is still the sum of  $T_A$  and  $T_D$  ( $T_O$ , outbound travel time is 860 days) but  $T_O$  now becomes the return travel time  $T_R$ .

(5) The configuration angle at arrival  $\gamma$  was the angle by which the target planet led Earth on the arrival date ( $45^\circ$  at point A); now it is the angle by which Earth leads the target planet on the departure date.

(6) For outbound trips, the vehicle arrives at the planet (point A) 50 days prior to the second subsequent opposition to the reference opposition; point A instead now indicates that the vehicle leaves the target planet 50 days after the second opposition prior to the reference opposition (note: at point A,  $\omega_p = 0.0831^\circ/\text{day}$ ,  $\omega_\oplus = 0.986^\circ/\text{day}$ ,  $\omega_\oplus - \omega_p \approx 0.9^\circ/\text{day} \times 50 \text{ days} \approx 45^\circ = \gamma$ ).

(7) The heliocentric travel angle is now  $\beta_R$  instead of  $\beta_O$  ( $173^\circ$ ).

Round trips require that the total angle traveled by the vehicle must equal the angle traveled by Earth during the same period of time less an integer number of revolutions of the Earth:

$$\omega_\oplus(T_O + T_S + T_R) - 360N = \beta_O + \omega_p T_S + \beta_R$$

Solving for the stay time  $T_S$  gives

$$T_S = \frac{(\beta_O + \beta_R) - \omega_\oplus(T_O + T_R) + 360N}{\omega_\oplus - \omega_p}$$

For planets more distant than the Earth from the Sun, the denominator is positive. For any pair  $T_O, T_R$  there is a pair  $\beta_O, \beta_R$  which corresponds to minimum  $\Delta V$ . For Hohmann trips  $\beta_O$  and  $\beta_R$  are each  $180^\circ$  and  $T_O + T_R \gg 365$  days; for shorter times  $\beta_O$  and  $\beta_R$  are each less than  $180^\circ$ , thus  $\beta_O + \beta_R \leq 360^\circ$ . The value of  $\omega_\oplus$  is approximately  $1^\circ$  per day. Thus, to keep  $T_S$  positive,  $N$  must be greater than 0.

When short mission times are desired (e.g., 300 to 450 days), as, for example, for opposition class manned Mars round trips,  $N$  must be zero in order to have a positive stay time  $T_S$  together with a low value of  $T_O + T_R + T_S$ . To meet the rendezvous condition,  $\beta_O$  and/or  $\beta_R$  must then be greater than optimum for the given values of  $T_O$  and/or  $T_R$ .

If longer times are allowed (e.g., for major planet trips or for Hohmann-type Mars round trips), it is possible to select  $N \geq 1$  giving a wider choice of the sum of the angles  $\beta_O$  and  $\beta_R$ . Then  $T_S$  may be chosen to be consistent with near-optimum values of  $\beta_O$  and  $\beta_R$ . As will be shown, this leads to symmetrical round trips.

### Symmetric Round Trips

Symmetric round trips which will be shown later to require minimum  $\sum_1^4 \Delta V$  are characterized by the fact that Earth and the target planet are in opposition (or conjunction) at the midpoint of the stay time. The outbound and return trajectories are mirror images and require identical  $\Delta V$ 's (see fig. 17):

$$T_O = T_R \quad (12)$$

$$\beta_O = \beta_R \quad (13)$$

The outbound leg is treated the same way as a one-way transfer. In the preceding example it was determined that the vehicle would arrive at Jupiter 50 days before the second subsequent opposition. Thus the date of departure from Jupiter is 50 days after that opposition giving a total stay time of 100 days.

The return trajectory of the vehicle is represented on the contour chart by exactly the same point as the outbound transfer. Therefore, for a symmetric trip, only one point need be found on the chart. The time of arrival before the opposition is equal to the time of departure after the opposition. For missions having a given stay time (e.g., 250 days), symmetric round trips would be feasible only for an arrival date of half the stay time (e.g., 125 days) before opposition. Stay times can be increased by additional synodic periods without changing the trajectories.

There are two types of symmetric round trips - flybys and orbiters. Both require a matching of boundary conditions at the target planet.

Turning angle boundary condition. - The direction of the hyperbolic velocity vector  $V_\infty$  must undergo a total turning angle  $\varphi$  at the target planet. The required angle  $\varphi$  is indicated in figure 18 for the reference low circular parking orbit for which the data were plotted in figures 7 to 10. As indicated in figure 18, part ( $\delta_2$  and  $\delta_3$ ) of the total turning angle is supplied by the gravitational attraction of the target planet. Unless a circular parking orbit is used, the rest ( $\sigma$ ) must be applied propulsively. As can also be seen,  $\varphi = \delta_2 + \delta_3 + \sigma$ .

Indicated in figure 19 is the fact that  $\varphi$  is a function of the arrival and departure asymptotes and of the stay time. For retrograde orbits,

$$\varphi = 360^\circ - \varphi_{\infty,2} - \varphi_{\infty,3} - \omega_p T_S = \delta_2 + \delta_3 + \sigma \quad (14)$$

For posigrade orbits,

$$\varphi = \varphi_{\infty,2} + \varphi_{\infty,3} + \omega_p T_S = \delta_2 + \delta_3 + \sigma \quad (15)$$

For flybys,  $T_S$  is zero and  $\varphi$  is only a function of  $\varphi_{\infty,2}$  and  $\varphi_{\infty,3}$ .

Flyby trips. - Flyby missions are of special interest because of the lower  $\Delta V$  requirements. Since time at the planet is then a premium, periapsis radius is of prime importance as this will strongly affect the observation obtained. For nonpropulsive symmetric flybys, there is only one periapsis at which the gravitational attraction of the planet will exactly supply the turning angle ( $\theta$ ) required. This radius can be determined as follows: From equation 8,

$$\cos \theta_{\infty, 2 \text{ or } 3} = \frac{1}{e_{\text{hyperbola}}} \quad (16)$$

From equation 10,

$$e_{\text{hyperbola}} = 1 + \left( \frac{V_{\infty}}{V_c} \right)^2 \quad (17)$$

However,

$$V_c^2 = \frac{\mu}{r_p} \quad (18)$$

hence

$$r_p = \frac{\mu}{V_{\infty}^2} (\sec \theta_{\infty, 2} - 1)$$

The flyby maneuver is shown in figure 20. Since there is no propulsion,  $\theta_{\infty, 2} = \varphi_{\infty, 2}$ , which can be found in tables XI to XIV.

Referring again to figure 20 shows that for trip times shorter than Hohmann time, the vehicle for minimum  $\Delta V$  trips approaches the planet orbit from within. These trajectories are characterized by retrograde passage with periapsis on the dark side of the planet.

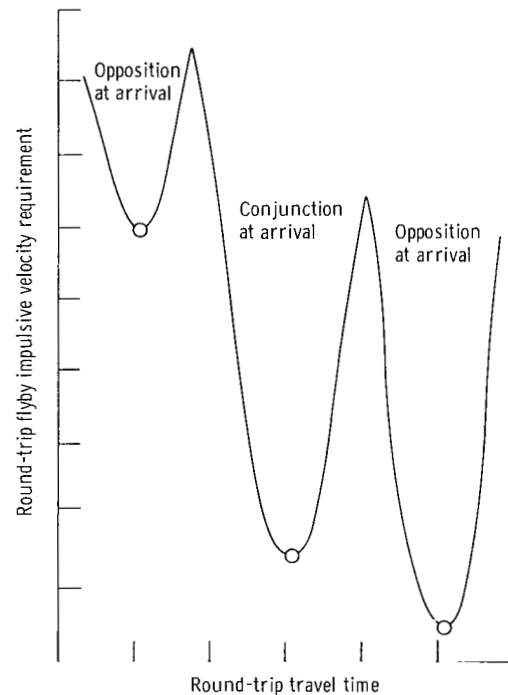
For Hohmann time, the vehicle arrives at a tangent to the orbit of the planet; that is,  $\theta_{\infty} = 90^\circ$ . For a symmetric flyby, the vehicle must also depart tangentially; therefore, there is no allowance for gravity turning. This implies that the vehicle must stay outside the sphere of influence since if it entered, the ensuing gravity turn would not permit the vehicle to leave tangentially. This same result could be obtained directly from equation (19) since  $\sec 90^\circ = \infty$ .

For times greater than Hohmann, the vehicle first passes through its aphelion and then approaches from outside the planet's orbit. (Recall fig. 4 and accompanying discussion.) As can be seen from tables XI to XIV, the asymptote angle of the approach hyperbola ( $\varphi_{\infty}$ ) becomes steeper and  $V_{\infty}$  increases. As a result, the required turning becomes larger and available turning angle due to gravity ( $\delta$ ) for a given  $R_p$  becomes smaller; both effects reducing the required value of  $R_p$ . Thus, for  $T_T > T_{\text{Hohmann}}$ , the vehicle executes a Sun-side periapsis posigrade passage.

Symmetric flyby trips can only take place when Earth and the target planet are either in conjunction or opposition at the arrival date. If the periapsis is allowed to vary as

shown by equation (19) then no propulsive effort will be required at the target planet. Round-trip impulsive velocity requirements for nonpropulsive flybys to the major planets where atmospheric braking at Earth return is allowed simply become  $\Delta V_1$  and are shown in figures 21 to 24.

In figure 21 is shown the determination of the minimum  $\Delta V$  for the opposition class trips of approximately 1800 days in duration. The sharp minimums in  $\Delta V$  occurring at each conjunction or opposition are shown by the data points in figures 21 to 24. The points have been connected by dotted lines to show trends. Thus symmetric trips do exist at trip times between the data points in the figures. The  $\Delta V$ 's are much higher. Nonsymmetric trips require even higher  $\Delta V$ 's. Sketch (b) represents how  $\Delta V$  would



(b) - Continuous variation of flyby impulsive velocity requirement with trip time for symmetric trips.

vary continuously with trip time. Also indicated in figures 21 to 24 is the periapsis radius for these missions. It can be seen in these figures that the required radii increase from values less than the planet radii at short travel times to values in excess of  $R_{\infty, p}$  at the Hohmann times and then gradually decrease for still longer times. The necessity of passage through the planet is avoided if the vehicle arrives at another position on the sphere of influence. However, the turning due to gravity will then be insufficient for a

symmetric flyby. As can be seen  $\sum \Delta V$  increases rapidly as trip time is shortened and periapsis decreases allowing for closer observation. For Jupiter a two order of magnitude reduction in periapsis requires a 17.5 percent increase in  $\Delta V$  requirement and requires only 56 percent as much time.

If it is desirable to have a low periapsis passage such as at 1.1 planet radii, a propulsive flyby can be made. Part of the turning angle required ( $\varphi$ ) (fig. 20) is supplied by the planet's gravitational field. The total turning required and the turning due to the planet's gravity are shown in figures 25 to 28. Again for symmetric trips, the planets must be in conjunction or opposition at arrival and the data points are connected with dashed lines. At short trip times,  $\varphi > \delta$  and a propulsive maneuver is necessary. This difference decreases with increasing travel time until the curves cross. At this point, the turning angle required is exactly supplied by the planet's gravity. Beyond this time, if periapsis is at 1.1 planet radii too great a turn will occur and the trip will not be symmetric. Therefore, either a propulsive maneuver or an increase in periapsis distance (with a corresponding degradation of observational capability) is required.

A method for calculating the  $\Delta V$  necessary at the target planet for constant periapsis flybys is shown in reference 8. This method is very similar to that discussed in the section on the use of elliptic parking orbits for round trips.

Orbital round trips. - Observation times at the target planet can be significantly increased by entering into a parking orbit. For symmetric round trips with a circular parking orbit at 1.1 planet radii, the mission  $\sum_1^4 \Delta V$  would simply be twice the one-way  $\Delta V$ 's shown on the contour charts (figs. 7 to 10) where the arrival date was half the stay time days before opposition (or conjunction). Again, if atmospheric braking at Earth return is allowed, these  $\Delta V$ 's could be reduced by up to  $\Delta V_1$ , found in tables XI to XIV for that trip, depending on the allowable entry velocity.

The  $\Delta V$ 's necessary to arrive or depart a circular parking orbit can be significantly reduced by the use of elliptic orbits. Reference 8 presents a technique for achieving an elliptic parking orbit using off-periapsis thrusting (see fig. 29). Part of the required turning  $\varphi$  results from the gravity turn due to the planet ( $\delta_2 + \delta_3$ ). The additional turning ( $\sigma$ ) is obtained by thrusting at some angle other than zero with respect to the local elliptic velocity; that is, the thrusting occurs neither tangent to the local velocity vector nor at the periapsis of either the ellipse or hyperbola. The parking ellipse has a periapsis of 1.1 planet radii and its axis at the midstay time or midtrip duration is the planet-Sun line for a symmetric round trip.

The contribution of the planet to the turn was shown in figures 25 to 28. The  $\Delta V$  necessary to enter circular and elliptic parking orbits is shown in figures 30 to 33. These  $\Delta V$ 's are correct only if the round trip is symmetric and the parking ellipse is symmetric with respect to the arrival and departure asymptote. At short travel times,  $V_\infty$  is large and  $\varphi$  required is very much greater than  $\delta$  from gravity. Recall



$$\varphi = 360 - \varphi_{\infty, 2} - \varphi_{\infty, 3} - \omega_p T_S \quad T_T < T_{\text{Hohmann}}$$

or

$$\varphi = \varphi_{\infty, 2} + \varphi_{\infty, 3} + \omega_p T_S \quad T_T > T_{\text{Hohmann}}$$

Therefore, high energy and a strong geometrical constraint cause a high  $\Delta V$  requirement. As travel time increases,  $V_{\infty}$  decreases,  $\varphi_{\text{required}}$  decreases, and  $\delta$  increases. Thus, a decrease in energy and an easier-to-satisfy boundary constraint cause a rapid fall off in  $\Delta V$  required. At optimum travel time,  $V_{\infty}$  is low and  $\varphi_{\text{required}} \approx \delta_{\text{gravity}}$  (the crossover points in figs. 25 to 28). This results in a minimum  $\Delta V$ . At even longer travel time,  $V_{\infty}$  decreases slowly while  $\delta_{\text{gravity}}$  becomes increasingly greater than  $\varphi$  required. The angular constraint predominates leading to a gradual increase in  $\sum \Delta V$ . Thus the use of elliptic orbits greatly shortens the optimum travel time for stopover round trips. Typically this optimum time is only about 50 per cent of Hohmann time.

The high steering losses suffered as travel time approaches Hohmann ( $\varphi_{\infty, 2} \rightarrow 90^\circ$ ) are discussed in reference 12. Highly nonoptimum burns before periapsis are necessary to leave the parking orbit on a symmetrical return trip. Nonsymmetrical trips require an even higher  $\sum \Delta V$ .

The mission  $\sum \Delta V$  requirements as a function of round-trip travel time are shown for symmetrical elliptic parking orbit trips to Jupiter, Saturn, Uranus, and Neptune in figures 34 to 37, respectively. These  $\Delta V$ 's are determined by entering the  $\Delta V$  contour charts at a  $T_A$  which is half of the desired stay time before the  $T_A$  at the subsequent opposition. The minimum  $\sum_1^2 \Delta V$  is then determined along with the corresponding trip time and angle. From tables XI to XIV or figures 30 to 33, the  $\Delta V$  requirement ( $\Delta V_2$ ) for circular orbit is then determined and subtracted. The period of the orbit was chosen to be one-fourth the stay time. The eccentricity of the parking orbit with periapsis at 1.1 planet radii is then determined. Either equation (9) or the data in figures 30 to 33 is then used to determine the  $\Delta V_2$  necessary to achieve the elliptic orbit, and this is then added to the previous result ( $\Delta V_1$ ). This then is the outbound  $\sum_1^2 \Delta V$  requirement. To calculate the round-trip  $\sum \Delta V$ , add to this result the  $\Delta V_3 = \Delta V_2$  necessary to leave the ellipse and the excess  $\Delta V_4$  (if any) of  $\Delta V_1$  and the assumed allowance re-entry velocity, 15 kilometers per second. These results are those shown in figures 34 to 37.

As in the case of symmetric flybys, the figures show a series of data points connected by dashed lines to show trends. A continuous curve for symmetric stopover trips would also look like sketch (b). Indicated in figure 34 are the  $\sum_1^4 \Delta V$ 's for symmetric

100-day stopover trips for the cycle corresponding to a round-trip duration of 1800 days showing how the minimum was obtained.

The data presented in tables XI to XIV combined with the data in figures 30 to 33 can be misleading. The  $\Delta V$ 's shown in the figures are only for entering particular ellipses, namely, those ellipses oriented symmetrically to the arrival and departure asymptote (symmetric round trips). Any other use of the figures can lead to false conclusions.

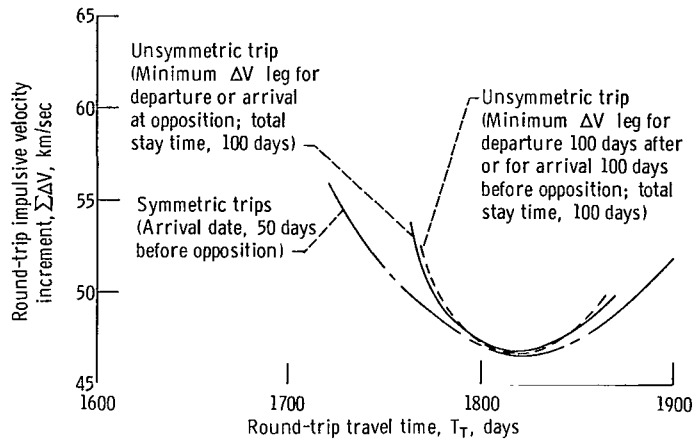
### Unsymmetric Round Trips

For unsymmetric round trips, the elements of the outbound and return trajectories will be different, and Earth and the target planet will not be in opposition at the midpoint of the stay time. Suppose, for instance, that the outbound transfer was the 860-day minimum energy transfer for circular to circular parking orbit discussed earlier but that a 250-day stay time was desired. The vehicle would arrive at Jupiter 50 days ( $T_A = 747$ ) before the second opposition ( $T_A = 797$ ). However, the departure would take place 200 days after that opposition. Since  $T_A$  for return trips is the departure date in days before the reference opposition,  $T_A = 597$  days. A return trajectory may be found by coming across the chart (fig. 7) to the minimum  $\Delta V$  line (point B) from a  $T_A$  of 597 days indicating a departure for Earth return 200 days after that opposition. The return trajectory is thus determined to have a travel time of about 710 days, a  $\sum_3^4 \Delta V$  requirement of 23.6 kilometers per second, and a heliocentric travel angle of  $164^\circ$ . The configuration angle at departure is  $180^\circ$ . The vehicle will travel for 597 days until the reference opposition occurs and return to Earth 113 days later.

Points C and D indicate other possible return trajectories (nonminimum  $\Delta V$ ), each leaving 200 days after opposition but having return travel times of 650 and 800 days, respectively.

These same return trajectories may be followed if the vehicle, having arrived, stayed for one or more synodic periods (399 days for Earth-Jupiter) and then left 200 days after an opposition.

It can be illustrated that symmetric trips require lower energy requirements  $\sum_1^4 \Delta V$  for a given stay time than unsymmetric trips. Sketch (c) shows the  $\sum_1^4 \Delta V$  requirements for 1.1 circular orbit to 1.1 circular orbit round trip to Jupiter having a stay time of 100 days. Indicated in the sketch are symmetric trips (solid curve), unsymmetric trips where a minimum  $\Delta V$  leg for arrival at or departure from the planet at opposition has been used (long-short dashed line), and unsymmetric trips where the minimum  $\Delta V$  leg for planet arrival at 100 days after opposition has been used (dashed line). In all cases



(c) - Comparison of symmetric and unsymmetric Jupiter round-trip circular parking orbits. Constant stay time, 100 days.

the symmetric trips require less  $\sum_1^4 \Delta V$ . The  $\sum_1^2 \Delta V$  decreases less rapidly as trip time is increased. Thus, even though travel time is increased on one leg the  $\Delta V$  for that leg is reduced; the choice of a stay time requires a shorter trip time on the other leg and an increase in  $\sum_1^4 \Delta V$ . This conclusion was also found and discussed in reference 8 and has been checked out on the computer using an optimum round-trip code. Cases, however, where the final ( $\Delta V_4$ ) impulsive velocity increment is eliminated by atmospheric braking do not lead to symmetric optimum trips. The two legs, however, are very similar and no great error is incurred by assuming they are identical.

## LUNAR TRAJECTORIES

### Satellites

Once at a planet, it is possible to proceed, if desired, with a scientific investigation of the planet's natural satellites. Jupiter, Saturn, Uranus, and Neptune are known to have at least 12, 9, 5, and 2 moons, respectively. The properties of these moons (taken from ref. 13) are given in table II.

Four of the moons of Jupiter (Io, Europa, Ganymede, and Callisto) are comparable to the size of the Earth's moon.

The four largest moons of Saturn are Tethys, Dione, Rhea, and Titan. Titan is apparently the largest moon of the solar system and is the only one presently known to possess an appreciable atmosphere. In addition, Saturn has a unique ring formation consisting of billions of particles.

Uranus is unique in that its axis of rotation lies almost in the plane of the ecliptic. All the other planets rotate counterclockwise about the axis pointing towards the North Star (above the ecliptic plane). Uranus' axis about which counterclockwise rotation occurs is approximately  $8^{\circ}$  below the ecliptic plane. Very little is known about the moons of Uranus; the four largest are Ariel, Umbriel, Titania, and Oberon. These moons are in retrograde orbit; that is, when viewed from above the ecliptic plane, they revolve about Uranus in a clockwise manner.

Triton, one of Neptune's two known satellites, is the densest moon in the solar system. It too revolves in a retrograde orbit about the planet.

### Mission Operations

The interlunar transfer operation consists basically of three maneuvers (each way). The space vehicle must (1) depart a planetocentric parking orbit, (2) make a plane change maneuver to bring it into the plane of the satellite, and (3) rendezvous with the target satellite.

Assumptions. - The principal assumptions made herein are as follows:

(1) Interlunar missions are to start from one of the symmetric retrograde elliptic parking orbits considered in the previous sections (outbound trip time was shorter than Hohmann time).

(2) An Earth return vehicle remains in this orbit while an excursion vehicle visits the moons. Therefore, it will be necessary to reenter this orbit before return to Earth.

(3) This parking orbit has a periapsis of 1.1 planetary radii, a period of 25, 50, or 100 days, and its line of apsides will be aligned with the planet-Sun line at midstay.

(4) The orbits of the moons are assumed to be circular and coplanar with respect to the equatorial plane of the planet. Since, however, the equatorial plane is inclined to the ecliptic plane, a plane change maneuver is necessary.

Transfer from parking orbit to first moon. - There are several ways to transfer from a parking orbit to the planet's equatorial plane. A particular mission mode was therefore selected which, while not necessarily optimum, provides representative  $\Delta V$ 's and travel times for interlunar operations. The data presented can be used to study other modes. The mission mode used herein may be summarized as follows:

(1) A velocity increment is applied at apoapsis to circularize the parking orbit (position a, fig. 38) (path A retrograde, path B posigrade). Note that the choice of which path to follow to Jupiter's and Saturn's moons which are in posigrade orbit is not obvious. Path B would never be followed to the retrograde orbit moons of Uranus and Neptune.

(2) The vehicle coasts to the intersection of the equatorial and ecliptic planes at which point a plane change is executed (position b, figs. 38(a) and (b)) so that the vehicle

is in circular orbit and revolves about the planet in the same direction as the moons.

(3) The vehicle then coasts in circular orbit in the equatorial plane until the moon to be visited and the vehicle are lined up correctly for a Hohmann transfer (position c, fig. 38(c)).

(4) The vehicle makes a rendezvous with the target moon (position d, fig. 38(c)).

As can be seen from figure 38(a), the  $\Delta V$  necessary to circularize the parking orbit at position a is less for path A than for path B. This is a result of having to cancel the velocity of the vehicle  $V_{veh}$  at apoapsis and then supplying circular velocity to the vehicle to follow the posigrade orbit, path B. Path A, on the other hand, being retrograde, has a lower velocity requirement since the vehicular velocity at apoapsis is in that direction.

At position b in figure 38(b), where the vehicle enters the equatorial plane in the same direction as the moons revolve, path A requires that the circular velocity of the vehicle be rotated by more than  $90^\circ$  in order to enter a posigrade orbit. Thus path A requires a much higher  $\Delta V$  than path B unless the moons are in retrograde orbit (i. e., Uranus and Neptune moons).

The Hohmann transfer from the circular orbit to the moon requires the same  $\Delta V$  regardless of which path was followed.

Upon rendezvous with the target moon, a circular orbit at 1.1 moon radii is established. As in the case of interplanetary transfers, the use of highly elliptic parking orbits can reduce the  $\Delta V$  for establishing the parking orbit (recall eq. (9)) by as much as  $(\sqrt{2} - 1)V_C$ .

If only one moon is to be visited, the return trip to the planetary parking orbit would consist of a Hohmann transfer to the initial circular orbit radius, a coast to the node between ecliptic and equatorial planes followed by a plane change maneuver into the ecliptic plane, a coast to apoapsis of the initial parking orbit and entry onto the ellipse at that point, and a rendezvous with the Earth return ship.

Multi-moon trajectories. - If, instead, it was desirable to visit more than one moon, the following procedure would be used. The vehicle would remain in orbit about the first moon until the first and second moons were lined up for a Hohmann transfer maneuver. This could require waiting up to one synodic period of the two moons. At the appropriate time, the transfer would be made and a parking orbit established at the second moon. This same procedure would be followed until the last moon was visited. To return to the initial planetary parking orbit, the vehicle would follow the same procedure used in the return when only one moon was visited.

The  $\Delta V$  and time requirements to visit the first moon for some of the moons of Jupiter, Saturn, Uranus, and Neptune are shown in tables III to VI, respectively.

As can be seen from the tables, path A should always be followed when the moons to be visited are in retrograde orbit (Uranus' and Neptune's moons) and path B when the

moons are in posigrade orbit (Jupiter's and Saturn's moons). If the vehicle velocity is in the opposite sense to the moon velocity, the vehicle velocity must be completely turned around at the node when the plane is changed (recall fig. 38(b)). This is a high  $\Delta V$  maneuver.

Also to be noted is that the  $\sum_a^d \Delta V$  for either path decreases as distance of the moon from the planet increases and/or as the period of the parking ellipse increases. The moons should be visited in consecutive order starting either at the outermost or innermost.

The impulsive velocity requirements for interlunar operations between the four moons of Jupiter, those of Saturn, and those of Uranus are shown in tables VII(a), VIII(a), and IX(a), respectively. The Hohmann transfer times and synodic periods between the moons are shown in tables VII(b), VIII(b), and IX(b).

To go back to the original parking orbit from the last moon requires the  $\sum_a^d \Delta V$  from tables III to VI.

#### Illustrative Mission to Saturn's Four Largest Moons

Suppose that a space vehicle is in a 50-day elliptic parking orbit about Saturn. The first step in visiting the four moons is to circularize this parking orbit at apoapsis. It was previously shown that path B was the path to follow. The total time to be spent in the circular parking orbit may be determined from the period in the table; in this case, the period is 138.74 days. (This orbit will be reentered at the point of departure.) The vehicle coasts to the node where a second velocity increment is applied to enter the equatorial plane. The total  $\sum_a^b \Delta V$  for these two maneuvers is found from table IV to be 4.39 kilometers per second. After coasting to the correct alinement for the Hohmann transfer to the target moon which in this case is Titan, the furthest of the four from Saturn, a  $\Delta V_c$  of 1.03 kilometers per second (from table IV) is applied. The time required for the transfer is 33.7 days and an impulsive velocity increment of 0.60 kilometer per second is applied to establish a circular orbit at 1.1 lunar radii.

From the previous discussion and reexamination of tables VIII(a) and (b), the correct sequence from this point is to go to Rhea, to Dione, and then to Tethys. The  $\Delta V$  from Titan to Rhea is 2.30 kilometers per second (including departing and establishing 1.1 lunar radii circular parking orbits). The time required is 4.84 days (table VIII(v)). If the moons had not been lined up correctly for the assumed Hohmann transfer, it might be necessary to wait up to one synodic period for the proper configuration. The maximum required time would be 4.84 days plus 6.32 days (synodic period, Titan-Rhea, table VIII(b)) or 11.2 days.

Table X summarizes this example mission; the total  $\Delta V$  required when the other maneuvers are calculated in a similar manner is 20.70 kilometers per second and the maximum travel time exclusive of any additional stay time at each moon is 226.4 days.

As previously mentioned,  $\Delta V$  savings of up to  $(\sqrt{2} - 1)V_{cpo}$  could be achieved by using elliptic parking orbits at each moon. Since  $V_{cpo}$  varies between 0.26 kilometers per second at Tethys and 1.85 kilometers per second at Titan, the possible savings in  $\Delta V$  is between 0.11 and 0.77 kilometers per second for each maneuver (two maneuvers at each moon). The total savings for the mission in table X would then be up to 2.32 kilometers per second or about 11 percent.

## SUMMARY OF RESULTS

The  $\Delta V$  requirements for one-way trajectories to major planets are presented in the form of contour charts. Tabular data include hyperbolic speeds, orbit elements and geometry, and  $\Delta V$  requirements for one-way trips to the major planets. Tables are also presented for required  $\Delta V$ 's for interlunar excursion of the moons of the major planets.

The data presented and illustrated (together with appropriate system inputs) can be used to perform preliminary mission studies. Such studies would be useful in defining "areas of opportunity" for various advanced propulsion systems and in comparing alternative systems.

A general mission  $\Delta V$  analysis was included to illustrate the use of the present data and the main features of the trajectories. It was found that one-way flyby missions require  $\Delta V$ 's of the order of 8 kilometers per second and travel times ranging from 1.1 years to Jupiter to 16 years to Neptune. Highly elliptical parking orbits can be entered for an additional 1 to 2 kilometers per second. Round-trip flybys also require 8 kilometers per second and 2.5 to 30 years. Elliptic parking orbit round trips require about 11 kilometers per second at a time roughly half of Hohmann. This optimum time is a result of favorable orientation of the parking orbit and reasonable hyperbolic speed. Beyond this time steering losses result in higher  $\Delta V$  requirements. Interlunar missions require an additional  $\Delta V$  on the order of 20 kilometers per second, depending on the number of moons visited.

Lewis Research Center,  
National Aeronautics and Space Administration,  
Cleveland, Ohio, September 29, 1970,  
124-08.

# APPENDIX - SYMBOLS

$a$	semi-major axis, km	$V_{H, p}$	heliocentric velocity at planet, km/sec
$e$	eccentricity	$V_{\oplus}$	Earth's orbital velocity, km/sec
$e_p$	eccentricity of parking orbit	$V_p$	planet's orbital velocity, km/sec
$N$	integer number	$V_{\infty}$	hyperbolic excess velocity, km/sec
$p$	semi-latus rectum, km	$V_{veh}$	vehicular velocity, km/sec
$p_o$	parking orbit	$\alpha$	path angle, deg
$R$	radius, km	$\beta_O$	outbound travel angle, deg
$R_a$	apoapsis, km	$\beta_R$	return travel angle, deg
$R_p$	periapsis, km	$\gamma$	configuration angle, deg
$R_{\infty, p}$	sphere of influence radius, km	$\delta$	turning angle due to gravity, deg
$T_A$	arrival date in days after reference opposition	$\epsilon$	angle between planet-Sun line and the line of apsides of flyby hyperbola, deg
$T_D$	departure date in days before reference opposition	$\theta_{\infty}$	asymptote angle with line of apsides of arrival or departure hyperbola, deg
$T_{Hohmann}$	Hohmann transfer travel time = 1/2 period of ellipse contangent to circular planet orbits, days	$\mu$	gravitational constant, km <sup>3</sup> /sec <sup>2</sup>
$T_O$	outbound travel time, days	$\sigma$	turning angle due to propulsive maneuver, deg
$T_R$	return travel time, days	$\varphi$	required turning angle, deg
$T_S$	stay time, days	$\varphi_{\infty}$	angle between arrival or departing asymptote and planet-Sun line, deg
$T_T$	total trip time, days	$\omega_p$	mean angular velocity of planet, deg/day
$V$	velocity, km/sec		
$\Delta V$	impulsive velocity increment, km/sec		
$V_c$	velocity in circular parking orbit, km/sec		
$V_{H, \oplus}$	heliocentric velocity at Earth, km/sec		



$\omega_{\oplus}$	mean angular velocity of Earth, deg/day	DV2	$\Delta V$ at planet arrival to enter 1.1 planet radius circular orbit, km/sec
Subscripts:			
a	apoapsis for interlunar transfers	VINF2	hyperbolic velocity at planet arrival, $V_{\infty, 2}$ , km/sec
b	at intersection of equatorial and orbit planes for interlunar transfers	PHI2	asymptote angle with planet-Sun line at planet arrival, $\varphi_{\infty, 2}$ , deg
c	start of Hohmann trajectory for first target moon for interlunar trajectories	ALPHA2	trajectory heliocentric path angle at planet, $\alpha$ , deg
d	at arrival at first moon for interlunar trajectories	VEL2	trajectory heliocentric velocity at planet, $V_{H, p}$ , km/sec
1	departure for outbound heliocentric transfers	BETA	heliocentric travel angle, $\beta$ , deg
2	arrival for outbound heliocentric transfers	ECCE	eccentricity of heliocentric transfer trajectory, e
3	departure for return heliocentric transfers	RMID	minimum solar approach distance (AU), if $< 1.0$ ; heliocentric radius at central angle $\beta/2$ , if $\geq 1.0$
4	arrival for return heliocentric transfers		
Symbols for tabular data:			
EDATE	top number, number of days from reference opposition to arrival, $T_A$ ; bottom number, number of days before next subsequent opposition	VEL1	trajectory heliocentric velocity at Earth, $V_{H, \oplus}$ , km/sec
		ALPHA1	trajectory heliocentric path angle at Earth, $\alpha$ , deg
		PHI1	asymptote angle with Earth-Sun line at Earth departure, $\varphi_{\infty, 1}$ , deg
TTIME	one-way travel time, $T_O$ , days	VINF1	hyperbolic velocity at Earth departure, $V_{\infty, \oplus}$ , km/sec
DVSUM	total $\Delta V$ for transfer from 1.1 Earth to 1.1 planet radii circular parking orbit, $\sum_{1}^2 \Delta V$ , km/sec	DV1	$\Delta V$ at Earth departure, km/sec

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TABLE I. - ORBITAL AND PHYSICAL PROPERTIES OF EARTH, JUPITER, SATURN, URANUS, AND NEPTUNE

	Earth ⊕	Jupiter ♃	Saturn ♄	Uranus ♅	Neptune ♆
Mean distance from Sun, $a$ , AU	1.000	5.202803	9.538843	19.181973	30.057707
Perihelion distance, $r_p$ , AU	0.983273	4.950829	9.007701	18.276561	29.80040
Aphelion distance, $r_a$ , AU	1.016727	5.454777	10.070082	20.087385	30.315374
Orbital eccentricity, $e$	0.0167272	0.0484305	0.0556922	0.0472012	0.0085724
Mean orbital velocity, $V_p$ , km/sec	29.7701	13.0516	9.6390	6.7715	5.4300
Mean angular velocity, $\omega_p$ , deg/day	0.986	0.0831	0.0335	0.0117	0.006
Inclination of orbital plane to ecliptic, $i$ , deg	0	1.3054166	2.48875	0.77250	1.77310
Inclination of equatorial plane to orbit, $\epsilon$ , deg	23.443597	3.067	26.733	97.884	28.8
Equatorial radius, $r$ , km	6378.16	71387	60408	23920	22260
Gravitational parameter, $\mu$ , $\text{km}^3/\text{sec}^2$	$3.98604 \times 10^5$	$1.26515 \times 10^8$	$3.78816 \times 10^7$	$5.79364 \times 10^6$	$6.86004 \times 10^6$
Period of revolution, years	1.00	11.86	29.46	84.0	164.8
Mean synodic period, days	0	398.88	378.09	369.66	367.49
Period of rotation	23 hr 56.07 min	9 hr 50.5 min	10 hr 14 min	10 hr 49 min	15 hr 48 min
Mass, $m$ , kg	$6.0 \times 10^{24}$	$1900 \times 10^{24}$	$570 \times 10^{24}$	$87 \times 10^{24}$	$103 \times 10^{24}$
Density, $\rho$ , $\text{g/cm}^3$	5.52	1.33	0.69	1.56	2.27
Surface gravity, $g$ , $\text{m/sec}^2$	9.81	25.1	10.72	8.83	11.0
Escape velocity, km/sec	11.2	61.	37.	22.	25.
Number of known satellites	1	12	9	5	2
Circular velocity at 1.1 equatorial radius distance, km/sec	7.54	40.14	23.88	14.82	16.69
Sphere of influence radius, $r_\infty$ , km	$9.25 \times 10^5$	$4.81 \times 10^7$	$5.46 \times 10^7$	$5.17 \times 10^7$	$8.61 \times 10^7$
Opposition date with Earth, Julian (Gregorian)		2444294 (Feb. 24, 1980)	2444313 (March 14, 1980)	2444374 (May 14, 1980)	2444403 (June 12, 1980)

TABLE II. - ORBITAL AND PHYSICAL PROPERTIES OF THE MAJOR-PLANET SATELLITES

## (a) Jupiter

	Satellite	Mean orbit radius		Sidereal period, days	Equatorial inclination of orbit, deg	Eccentricity of orbit	Mass, kg	Radius, km	Gravitational parameter, km <sup>3</sup> /sec <sup>2</sup>
		km	Planet radii						
I	Io	4.218×10 <sup>5</sup>	5.905	1.769	0.3	Small	791×10 <sup>20</sup>	1660	4841
II	Europa	6.714	9.401	3.551	.47	and	477	1440	3130
III	Ganymede	10.71	14.995	7.155	.18	vari-	1531	2470	10319
IV	Callisto	18.84	26.379	16.689	.25	able	904	2340	6455
V	-----	1.815	2.540	.498	.46	0.003	-----	80	-----
VI	-----	115.0	161	250.6	-----	.155	-----	60	-----
VII	-----	117.5	165	259.8	-----	.207	-----	20	-----
VIII	-----	235.0	330	<sup>a</sup> 738.9	-----	.38	-----	20	-----
IX	-----	237.0	332	<sup>a</sup> 755	-----	.25	-----	11	-----
X	-----	117.5	165	260	-----	.14	-----	10	-----
XI	-----	225.0	315	<sup>a</sup> 696	-----	.207	-----	12	-----
XII	-----	210.0	294	<sup>a</sup> 625	-----	.13	-----	10	-----

## (b) Saturn

I	Mimas	1.857×10 <sup>5</sup>	3.11	0.942	1.5	0.0196	0.378×10 <sup>20</sup>	260	2.523
II	Enceladus	2.382	3.943	1.370	.0	.0045	.857	300	5.722
III	Tethys	2.948	4.880	1.888	1.1	0	6.45	600	43.035
IV	Dione	3.777	6.252	2.737	.0	.0021	10.26	650	68.465
V	Rhea	5.275	8.732	4.518	.3	.0009	21.98	900	146.67
VI	Titan	12.23	20.25	15.945	.3	.0289	1407	2500	9390
VII	Hyperion	14.84	24.57	21.277	.6	.110	.440	200	2934
VIII	Japetus	35.63	58.98	79.331	14.7	.029	13.92	600	92.17
IX	Phoebe	129.5	214.4	<sup>a</sup> 550.45	150	.166	-----	150	-----

## (c) Uranus

I	Ariel	1.918×10 <sup>5</sup>	8.018	<sup>a</sup> 2.520	0	0.007	-----	300	-----
II	Umbriel	2.673	11.175	<sup>a</sup> 4.144	↓	.008	-----	200	-----
III	Titania	4.387	18.340	<sup>a</sup> 8.706	↓	.023	-----	500	-----
IV	Oberon	5.686	24.52	<sup>a</sup> 13.463	↓	.01	-----	400	-----
V	Miranda	1.301	5.439	<sup>a</sup> 1.414	-----	-----	-----	---	-----

## (d) Neptune

I	Triton	3.536×10 <sup>5</sup>	15.88	<sup>a</sup> 5.877	160	0	1470×10 <sup>20</sup>	2000	8.803
II	Nereid	60.0	27	500	-----	.7	.343	150	0.002

<sup>a</sup>Retrograde.

TABLE III. - IMPULSIVE VELOCITY INCREMENTS AND TRAVEL TIMES  
REQUIRED FOR MISSIONS TO FOUR OF JUPITER'S MOONS

Elliptical parking orbit period, days	Satellite	$\sum_a^b \Delta V$	$\Delta V_c$	$\Delta V_d$	Circular orbit period at elliptical parking orbit apoapsis distance, days	Travel time on Hohmann trajectory from circular orbit to satellite, days	
		Impulsive velocity increment to circularize parking orbit and make change of node from orbit into equatorial plane in same direction as moon	Impulsive velocity increment from circular parking orbit in equatorial plane onto Hohmann trajectory	Impulsive velocity increment at arrival into 1.1 radii circular parking orbit			
		Path A	Path B				
25	Io	14.408	6.293	3.064	69.03	13.83	
	Europa			2.589		3.366	14.82
	Ganymede			2.035		1.678	16.46
	Callisto			1.287		.837	19.97
50	Io	11.550	4.831	2.743	139.30	26.66	
	Europa			2.427		3.769	27.90
	Ganymede			2.049		2.103	29.91
	Callisto			1.513		1.245	34.14
100	Io	9.244	3.733	2.379	280.16	52.09	
	Europa			2.173		4.037	53.62
	Ganymede			1.922		2.400	56.11
	Callisto			1.554		1.567	61.29

TABLE IV. - IMPULSIVE VELOCITY INCREMENTS AND TRAVEL TIMES  
REQUIRED FOR MISSIONS TO FOUR OF SATURN'S MOONS

Elliptical parking orbit period, days	Satellite	$\sum_a^b \Delta V$ Impulsive velocity increment to circularize parking orbit and make change of node from orbit into equatorial plane in same direction as moon		$\Delta V_c$ Impulsive velocity increment from circular parking orbit in equatorial plane onto Hohmann trajectory	$\Delta V_d$ Impulsive velocity increment at arrival into 1.1 radii circular parking orbit	Circular orbit period at elliptical parking orbit apoapsis distance, days	Travel time on Hohmann trajectory from circular orbit to satellite, days
		Path A	Path B				
25	Tethys	9.401	5.695	2.024	3.818	68.58	13.82
	Dione			1.858	3.167		14.31
	Rhea			1.610	2.394		15.21
	Titan			.887	.386		19.63
50	Tethys	7.544	4.391	1.818	4.061	138.74	26.65
	Dione			1.708	3.431		27.26
	Rhea			1.542	2.685		28.38
	Titan			1.032	.598		33.73
100	Tethys	6.045	3.406	1.581	4.218	279.46	52.08
	Dione			1.509	3.605		52.84
	Rhea			1.400	2.879		54.22
	Titan			1.054	.771		60.80

TABLE V. - IMPULSIVE VELOCITY INCREMENTS AND TRAVEL TIMES  
REQUIRED FOR MISSION TO FOUR OF URANUS' MOONS

Elliptical parking orbit period, days	Satellite	$\sum_a^b \Delta V$ Impulsive velocity increment to circularize parking orbit and make change at node from orbit into equatorial plane in same direction as Moon for path A	$\Delta V_c$ Impulsive velocity increment from circular parking orbit in equatorial plane onto Hohmann trajectory	Impulsive velocity increment at arrival into 1.1 radii circular parking orbit	Circular orbit period at elliptical parking orbit apoapsis distance, days	Travel time on Hohmann trajectory from circular orbit to satellite, days
25	Ariel	3.910	1.012	1.880	69.13	14.30
	Umbriel		.883	1.474		15.15
	Titania		.667	.958		17.13
	Oberon		.544	.726		18.69
50	Ariel	3.146	0.926	2.021	139.43	27.25
	Umbriel		.839	1.632		28.30
	Titania		.690	1.141		30.73
	Oberon		.602	.920		32.61
100	Ariel	2.526	0.815	2.113	280.33	52.82
	Umbriel		.759	1.738		54.12
	Titania		.658	1.268		57.12
	Oberon		.598	1.057		59.43

TABLE VI. - IMPULSIVE VELOCITY INCREMENTS AND TRAVEL TIMES  
REQUIRED FOR MISSION TO ONE OF NEPTUNE'S MOONS

Elliptical parking orbit period, days	Satellite	$\sum_a^b \Delta V$ Impulsive velocity increment to circularize parking orbit and make change at node from orbit into equatorial plane in same direction as Moon for path A	$\Delta V_c$ Impulsive velocity increment from circular parking orbit in equatorial plane onto Hohmann trajectory	Impulsive velocity increment at arrival into 1.1 radii circular parking orbit	Circular orbit period at elliptical parking orbit apoapsis distance, days	Travel time on Hohmann trajectory from circular orbit to satellite, days
25	Triton	2.578	0.835	1.285	69.32	15.95
50	Triton	2.092	.820	1.490	139.67	29.28
100	Triton	1.690	.757	1.577	280.64	55.34



TABLE VII. - INTERLUNAR MISSIONS AT JUPITER

[Hohmann transfers; 1.1 radii circular parking orbit at each satellite.]

(a) Impulsive velocity increments required

Arrive \ Depart	Io	Europa	Ganymede	Callisto
	Impulsive velocity increments, km/sec			
Io	-----	2.5313	4.4086	6.0674
Europa	2.5313	-----	2.1906	3.7389
Ganymede	4.4086	2.1906	-----	2.1100
Callisto	6.0674	3.7389	2.1100	-----

(b) Time required

Arrive \ Depart	Io		Europa		Ganymede		Callisto	
	Hohmann transfer time, days	Synodic period, days	Hohmann transfer time, days	Synodic period, days	Hohmann transfer time, days	Synodic period, days	Hohmann transfer time, days	Synodic period, days
Io	----	----	1.31	3.53	2.08	2.35	4.00	1.98
Europa	1.31	3.53	----	----	2.63	7.06	4.67	4.52
Ganymede	2.08	2.35	2.63	7.06	----	----	5.81	12.54
Callisto	4.00	1.98	4.67	4.52	5.81	12.54	----	----

TABLE VIII. - INTERLUNAR MISSIONS AT SATURN

[Hohmann transfers; 1.1 radii circular parking orbit at each satellite.]

(a) Impulsive velocity increments required

Arrive Depart	Tethys	Dione	Rhea	Titan
	Impulsive velocity increment, km/sec			
Tethys	-----	0.9770	2.3146	4.3231
Dione	0.9770	-----	1.1278	3.3887
Rhea	2.3146	1.1278	-----	2.2981
Titan	4.3231	3.3887	2.2981	-----

(b) Time required

Arrive Depart	Tethys		Dione		Rhea		Titan	
	Hohmann transfer time, days	Synodic period, days	Hohmann transfer time, days	Synodic period, days	Hohmann transfer time, days	Synodic period, days	Hohmann transfer time, days	Synodic period, days
Tethys	----	----	1.15	6.09	1.56	3.25	3.91	2.15
Dione	1.15	6.09	----	----	1.80	6.96	4.23	3.31
Rhea	1.56	3.25	1.80	6.96	----	----	4.84	6.32
Titan	3.91	2.15	4.23	3.31	4.84	6.32	----	----

TABLE IX. - INTERLUNAR MISSIONS AT URANUS

Hohmann transfers; match moon's velocity only.

(a) Impulsive velocity increments required

Arrive \ Depart	Ariel	Umbriel	Titania	Oberon
Impulsive velocity increment, km/sec				
Ariel	-----	0.8347	1.7869	2.1500
Umbriel	0.8347	-----	1.0062	1.4139
Titania	1.7869	1.0062	-----	0.4401
Oberon	2.1500	1.4139	0.4401	-----

(b) Time required

Arrive \ Depart	Ariel		Umbriel		Titania		Oberon	
	Hohmann transfer time, days	Synodic period, days	Hohmann transfer time, days	Synodic period, days	Hohmann transfer time, days	Synodic period, days	Hohmann transfer time, days	Synodic period, days
Ariel	----	----	1.66	6.47	2.67	3.57	3.54	3.16
Umbriel	1.66	6.47	----	----	3.17	7.96	4.08	6.16
Titania	2.67	3.57	3.17	7.96	----	-----	5.40	27.24
Oberon	3.54	3.16	4.08	6.16	5.40	27.24	----	-----

TABLE X. - SUMMARY FOR SATURN FOUR-MOON MISSION FOLLOW-  
ING PATH B FROM A 50-DAY ELLIPTICAL PARKING ORBIT

		Maximum travel time, days
Impulsive velocity increment, $\sum_a^b \Delta V$ , km/sec	4.39	69.4
Impulsive velocity increment for start of Hohmann trajectory to Titan, $\Delta V_c$ , km/sec	1.03	33.7
Impulsive velocity increment at arrival at first moon, $\Delta V_d$ , km/sec	0.60	
Impulsive velocity increment, $\Delta V$ , km/sec:		
Titan to Rhea	2.30	11.2
Rhea to Dione	1.13	8.8
Dione to Tethys	0.98	7.2
<sup>a</sup> Impulsive velocity increment at departure from Tethys, $\Delta V_d$ , km/sec	4.06	
<sup>a</sup> Impulsive velocity increment for start of Hohmann trajectory for return to parking orbit, $\Delta V_c$ , km/sec	1.82	
<sup>a</sup> Impulsive velocity increment, $\sum_a^b \Delta V$ , km/sec	4.39	69.4
	20.70	226.4

<sup>a</sup>Return to parking orbit.

TABLE XI. - TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

PARKING ORBIT TO 1.1 JUPITER RADII CIRCULAR PARKING ORBIT

ECAT#	TIME	CV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
50 349	140.0	80.44 *	43.147	61.013	-0.915 *	17.052	62.597	92.897	5.026	0.997	73.145	-3.890 *	263.448	43.491	37.239
	150.0	76.88 *	41.189	58.240	-0.290 *	17.093	59.749	102.757	4.563	0.978	70.723	-10.945 *	251.298	41.878	35.674
	160.0	74.25 *	39.377	55.682	0.506 *	17.288	57.079	112.617	4.106	0.944	68.482	-17.407 *	240.064	41.053	34.875
	170.0	72.31 *	37.714	53.281	1.432 *	17.590	54.538	122.477	3.670	0.898	66.380	-23.273 *	229.957	40.766	34.597
	180.0	71.76 *	36.154	50.975	2.453 *	17.952	52.075	132.337	3.264	0.846	64.371	-28.535 *	221.054	40.777	34.609
	190.0	69.43 *	34.675	48.758	3.540 *	18.336	49.671	142.191	2.897	0.790	62.442	-33.203 *	213.319	40.920	34.747
	200.0	68.13 *	33.276	46.557	4.667 *	18.710	47.318	152.057	2.572	0.734	60.587	-37.301 *	206.648	41.080	34.901
	210.0	66.97 *	31.948	44.434	5.818 *	19.057	45.024	161.917	2.290	0.678	58.813	-40.876 *	200.903	41.200	35.018
	220.0	65.76 *	30.694	42.368	6.984 *	19.361	42.789	171.777	2.051	0.625	57.120	-43.983 *	195.942	41.253	35.069
	230.0	64.57 *	29.514	40.365	8.164 *	19.620	40.621	181.637	1.849	0.574	55.515	-46.690 *	191.625	41.241	35.058
75 323	170.0	64.02 *	35.512	50.010	0.967 *	16.281	51.472	99.905	3.586	0.993	63.884	-6.183 *	258.474	34.437	28.510
	180.0	62.35 *	34.322	48.169	1.610 *	16.350	49.570	109.765	3.314	0.969	62.362	-12.591 *	246.383	33.934	28.030
	190.0	61.27 *	33.201	46.437	2.404 *	16.542	47.708	119.625	3.037	0.933	60.892	-18.431 *	235.488	33.979	28.073
	200.0	60.55 *	32.128	44.725	3.318 *	16.811	45.860	129.485	2.766	0.888	59.455	-23.705 *	225.903	34.350	28.427
	210.0	60.02 *	31.092	43.030	4.319 *	17.121	44.016	139.345	2.509	0.838	58.045	-28.428 *	217.594	34.874	28.928
	220.0	59.55 *	30.088	41.347	5.384 *	17.439	42.174	149.205	2.274	0.785	56.661	-32.625 *	210.439	35.432	29.462
	230.0	59.05 *	29.117	39.676	6.495 *	17.744	40.341	159.065	2.062	0.732	55.310	-36.335 *	204.284	35.953	29.961
	240.0	58.57 *	28.182	38.021	7.641 *	18.020	38.522	168.925	1.876	0.679	53.998	-39.608 *	198.967	36.402	30.391
	250.0	58.03 *	27.247	36.387	8.820 *	18.260	36.725	178.785	1.715	0.628	52.731	-42.499 *	194.341	36.770	30.745
	260.0	57.49 *	26.440	34.792	10.029 *	18.464	34.967	188.645	1.577	0.580	51.522	-45.080 *	190.271	37.076	31.039
100 298	170.0	54.60 *	31.367	43.485	2.334 *	15.446	44.849	97.054	2.888	1.000	58.710	-1.507 *	266.944	28.961	23.321
	200.0	53.43 *	30.565	42.157	2.818 *	15.386	43.516	106.914	2.730	0.987	57.667	-7.885 *	253.869	28.473	22.864
	210.0	52.79 *	29.805	40.405	3.475 *	15.466	42.139	116.774	2.555	0.961	56.635	-13.722 *	241.982	28.600	22.983
	220.0	52.34 *	29.063	39.581	4.272 *	15.647	40.743	126.634	2.375	0.924	55.604	-19.029 *	231.504	29.126	23.477
	230.0	52.00 *	28.330	38.766	5.150 *	15.815	39.318	136.494	2.196	0.880	54.569	-23.820 *	222.437	29.862	24.169
	240.0	51.74 *	27.606	38.075	6.175 *	16.134	37.864	146.354	2.025	0.831	53.531	-28.119 *	214.658	30.672	24.932
	250.0	51.58 *	26.892	37.430	7.237 *	16.393	36.387	156.214	1.866	0.781	52.496	-31.961 *	207.988	31.469	25.687
	260.0	51.47 *	26.197	36.812	8.356 *	16.635	34.893	166.074	1.722	0.730	51.472	-35.388 *	202.246	32.205	26.384
	270.0	51.33 *	25.510	36.279	9.521 *	16.854	33.400	175.934	1.594	0.679	50.472	-38.460 *	197.257	32.871	27.018
	280.0	51.23 *	24.854	35.652	10.735 *	17.047	31.911	185.794	1.482	0.630	49.499	-41.224 *	192.882	33.462	27.580
125 273	210.0	47.95 *	24.274	34.105	3.829 *	14.530	39.520	94.202	2.375	1.358	54.715	3.051 *	-83.320	25.037	19.673
	220.0	46.77 *	27.733	37.207	4.145 *	14.399	38.529	104.062	2.288	0.998	54.003	-3.315 *	262.631	24.344	19.037
	230.0	46.26 *	27.210	36.744	4.655 *	14.365	37.513	113.922	2.181	0.981	53.283	-9.168 *	245.604	24.359	19.051
	240.0	46.21 *	26.692	35.272	5.327 *	14.444	36.455	123.782	2.063	0.953	52.544	-14.518 *	238.019	24.870	19.520
	250.0	46.43 *	26.172	34.277	6.134 *	14.598	35.350	133.642	1.933	0.916	51.783	-19.383 *	227.987	25.677	20.263
	260.0	46.79 *	25.647	33.251	7.050 *	14.793	34.197	143.502	1.816	0.873	51.003	-23.784 *	219.410	26.622	21.138
	270.0	47.16 *	25.115	32.194	8.056 *	15.002	33.000	153.362	1.697	0.826	50.208	-27.752 *	212.095	27.597	22.045
	280.0	47.53 *	24.594	31.116	9.134 *	15.209	31.774	163.222	1.587	0.777	49.411	-31.332 *	205.826	28.545	22.931
	290.0	47.93 *	24.073	30.017	10.280 *	15.398	30.521	173.082	1.485	0.728	48.614	-34.564 *	200.412	29.428	23.760
	300.0	48.30 *	23.563	28.910	11.489 *	15.564	29.255	182.942	1.394	0.678	47.830	-37.502 *	195.682	30.244	24.529
150 248	210.0	43.60 *	25.727	33.831	5.469 *	13.714	35.054	91.350	1.989	1.414	51.581	7.468 *	-72.586	22.400	17.269
	240.0	41.69 *	25.556	33.070	5.607 *	13.386	34.346	101.210	1.946	1.344	51.103	1.103 *	-87.359	21.346	16.321
	250.0	41.20 *	25.175	32.348	5.960 *	13.234	33.601	111.070	1.885	0.995	50.605	-4.775 *	258.476	21.084	16.087
	260.0	41.23 *	24.831	31.606	6.500 *	13.212	32.801	120.930	1.809	0.976	50.077	-10.172 *	245.625	21.430	16.397
	270.0	41.54 *	24.463	30.842	7.104 *	13.284	31.949	130.790	1.726	0.946	49.523	-15.114 *	234.405	22.185	17.075
	280.0	42.00 *	24.084	30.040	8.020 *	13.413	31.038	140.650	1.639	0.909	48.941	-19.617 *	224.823	23.166	17.962
	290.0	42.64 *	23.693	29.200	8.956 *	13.570	30.072	150.510	1.551	0.866	48.334	-23.711 *	216.694	24.239	18.941
	300.0	43.23 *	23.295	28.323	9.988 *	13.733	29.057	160.370	1.466	0.820	47.709	-27.427 *	209.781	25.320	19.933
	310.0	43.81 *	22.903	27.424	11.112 *	13.893	28.010	170.230	1.387	0.773	47.079	-30.819 *	203.845	26.370	20.905
	320.0	44.32 *	22.504	26.494	12.297 *	14.031	26.925	180.090	1.314	0.724	46.441	-33.913 *	198.702	27.355	21.820
ECAT#	TIME	CV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

ECATE	TIME	CV SUM *	CV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1
175	260.0	35.41 *	23.864	29.567	7.222 *	72.347	30.782	98.359	1.680	1.403	48.779	5.359 *	-76.376	19.340	14.544
223	270.0	37.58 *	23.614	29.022	7.406 *	72.073	30.248	108.219	1.648	1.000	48.444	-0.548 *	268.578	18.677	13.967
	280.0	37.37 *	23.361	28.462	7.798 *	71.949	29.658	118.079	1.603	0.991	48.077	-6.002 *	254.432	18.731	14.014
	290.0	37.62 *	23.099	27.972	8.369 *	71.934	29.005	127.939	1.548	0.970	47.677	-11.018 *	241.848	19.313	14.521
	300.0	38.15 *	22.823	27.241	9.096 *	71.990	28.284	137.799	1.487	0.939	47.242	-15.615 *	231.046	20.226	15.325
	310.0	38.83 *	22.538	26.574	9.953 *	72.091	27.507	147.659	1.423	0.902	46.781	-19.825 *	221.906	21.318	16.296
	320.0	39.58 *	22.241	25.867	10.925 *	72.210	26.673	157.519	1.360	0.860	46.296	-23.676 *	214.188	22.475	17.336
	330.0	40.32 *	21.936	25.123	12.001 *	72.331	25.790	167.379	1.298	0.814	45.793	-27.205 *	207.626	23.629	18.384
	340.0	41.03 *	21.627	24.347	13.174 *	72.440	24.867	177.239	1.240	0.767	45.279	-30.452 *	201.981	24.747	19.407
	350.0	41.71 *	21.317	23.552	14.443 *	72.532	23.911	187.099	1.188	0.719	44.761	-33.460 *	197.059	25.815	20.390

TABLE XI. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 JUPITER RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	DV SLM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1
195	260.C	40.51 *	22.544	21.520	9.689 *	72.756	28.404	76.360	1.462	1.581	47.314	22.157 *	-38.144	22.728	17.565
195	270.C	37.91 *	22.740	27.048	9.187 *	71.888	28.093	86.220	1.476	1.520	47.128	15.391 *	-51.398	20.048	15.168
	280.C	36.06 *	22.556	26.618	8.954 *	71.283	27.762	96.080	1.475	1.455	46.932	9.035 *	-66.032	18.144	13.505
	290.C	34.56 *	22.380	26.200	8.974 *	70.994	27.388	105.940	1.461	1.367	46.711	3.121 *	-81.427	17.062	12.580
	300.C	34.53 *	22.201	25.770	9.221 *	70.672	26.957	115.800	1.435	0.999	46.460	-2.362 *	263.439	16.760	12.324
	310.C	34.62 *	22.014	25.314	9.669 *	70.574	26.460	125.660	1.400	0.986	46.173	-7.430 *	249.555	17.092	12.606
	320.C	35.08 *	21.814	24.820	10.292 *	70.564	25.896	135.520	1.358	0.962	45.853	-12.100 *	237.460	17.869	13.269
	330.C	35.77 *	21.602	24.285	11.068 *	70.607	25.267	145.380	1.312	0.930	45.500	-16.397 *	227.218	18.911	14.170
	340.C	36.57 *	21.377	23.708	11.979 *	70.680	24.576	155.240	1.265	0.852	45.120	-20.351 *	218.617	20.082	15.198
	350.C	37.42 *	21.143	23.092	13.012 *	70.761	23.830	165.100	1.218	0.849	44.718	-23.994 *	211.364	21.296	16.276
		*			*							*			
122	250.C	36.66 *	21.652	24.412	11.270 *	70.921	25.333	83.941	1.308	1.570	45.537	18.899 *	-42.068	19.868	15.009
175	300.C	34.56 *	21.518	24.072	10.846 *	70.178	25.131	93.801	1.315	1.507	45.425	12.555 *	-55.872	17.599	13.038
	310.C	33.16 *	21.393	23.748	10.690 *	69.669	24.886	103.661	1.311	1.441	45.290	6.631 *	-71.033	16.090	11.763
	320.C	32.43 *	21.265	23.415	10.782 *	69.344	24.582	113.521	1.257	1.373	45.123	1.120 *	-86.709	15.370	11.166
	330.C	32.30 *	21.132	23.063	11.094 *	69.163	24.216	123.381	1.276	0.956	44.925	-3.998 *	258.241	15.368	11.165
	340.C	32.61 *	20.987	22.675	11.605 *	69.081	23.779	133.241	1.248	0.979	44.691	-8.733 *	244.773	15.921	11.622
	350.C	33.23 *	20.831	22.251	12.287 *	69.068	23.278	143.101	1.216	0.953	44.426	-13.116 *	233.243	16.847	12.398
	360.C	34.03 *	20.661	21.783	13.127 *	69.092	22.709	152.961	1.182	0.920	44.131	-17.165 *	223.582	17.980	13.364
	370.C	34.91 *	20.481	21.275	14.108 *	69.132	22.082	162.821	1.146	0.881	43.811	-20.915 *	215.497	19.210	14.431
	380.C	35.83 *	20.292	20.730	15.220 *	69.172	21.401	172.681	1.111	0.838	43.472	-24.398 *	208.672	20.467	15.538
		*			*							*			
248	310.C	36.16 *	20.773	22.054	13.644 *	69.941	22.857	81.090	1.177	1.623	44.207	22.681 *	-32.878	20.297	15.388
150	320.C	33.79 *	20.674	21.817	12.995 *	69.035	22.766	90.950	1.186	1.563	44.160	16.325 *	-45.450	17.694	13.119
	330.C	32.06 *	20.583	21.563	12.632 *	68.387	22.632	100.810	1.188	1.499	44.091	10.371 *	-59.732	15.748	11.478
	340.C	30.99 *	20.492	21.307	12.539 *	67.946	22.441	110.670	1.183	1.432	43.993	4.812 *	-75.302	14.544	10.494
	350.C	30.53 *	20.398	21.036	12.687 *	67.668	22.189	120.530	1.171	1.400	43.865	-0.372 *	268.843	14.097	10.136
	360.C	30.60 *	20.296	20.741	13.058 *	67.508	21.868	130.390	1.154	0.992	43.704	-5.192 *	253.959	14.312	10.307
	370.C	31.06 *	20.182	20.407	13.626 *	67.428	21.477	140.250	1.132	0.973	43.510	-9.668 *	240.890	15.019	10.879
	380.C	31.78 *	20.057	20.035	14.371 *	67.400	21.023	150.110	1.108	0.946	43.287	-13.827 *	229.848	16.044	11.724
	390.C	32.65 *	19.921	19.622	15.279 *	67.396	20.503	159.970	1.082	0.911	43.037	-17.692 *	220.655	17.240	12.731
	400.C	33.60 *	19.775	19.171	16.339 *	67.398	19.927	169.829	1.055	0.872	42.766	-21.296 *	212.971	18.514	13.825
		*			*							*			
273	330.C	36.15 *	20.077	20.054	16.248 *	68.937	20.672	78.238	1.079	1.675	43.118	26.301 *	-24.940	21.070	16.074
125	340.C	33.57 *	19.996	19.851	15.370 *	67.855	20.665	88.098	1.087	1.617	43.115	19.941 *	-36.195	18.221	13.571
	350.C	31.55 *	19.928	19.642	14.787 *	67.060	20.623	97.958	1.090	1.555	43.095	13.961 *	-49.214	15.917	11.618
	360.C	30.13 *	19.863	19.445	14.489 *	66.498	20.529	107.818	1.089	1.490	43.050	8.354 *	-63.997	14.267	10.272
	370.C	29.34 *	19.797	19.235	14.459 *	66.120	20.374	117.678	1.084	1.422	42.976	3.110 *	-79.940	13.348	9.544
	380.C	29.11 *	19.724	19.011	14.673 *	65.876	20.151	127.538	1.074	0.999	42.871	-1.786 *	264.168	13.148	9.388
	390.C	29.35 *	19.642	18.752	15.110 *	65.729	19.859	137.398	1.060	0.988	42.734	-6.350 *	249.588	13.553	9.705
	400.C	29.92 *	19.550	18.457	15.749 *	65.643	19.500	147.258	1.043	0.967	42.568	-10.606 *	237.014	14.391	10.371
	410.C	30.72 *	19.448	18.123	16.572 *	65.592	19.075	157.118	1.025	0.937	42.376	-14.578 *	226.505	15.496	11.270
	420.C	31.65 *	19.337	17.754	17.565 *	65.555	18.592	167.978	1.005	0.902	42.160	-18.296 *	217.780	16.746	12.313
		*			*							*			
298	360.C	33.74 *	19.451	18.134	17.987 *	66.633	18.789	85.246	1.012	1.671	42.247	23.407 *	-28.203	19.045	14.287
100	370.C	31.48 *	19.397	17.954	17.170 *	65.684	18.824	95.106	1.014	1.611	42.263	17.405 *	-39.868	16.471	12.081
	380.C	29.77 *	19.349	17.795	16.654 *	64.995	18.812	104.966	1.014	1.547	42.258	11.757 *	-53.416	14.447	10.416
	390.C	28.64 *	19.302	17.636	16.426 *	64.512	18.740	114.826	1.012	1.480	42.226	6.457 *	-68.714	13.080	9.336
	400.C	28.09 *	19.251	17.463	16.466 *	64.184	18.604	124.686	1.006	1.412	42.166	1.490 *	-84.939	12.430	8.837
	410.C	28.05 *	19.192	17.264	16.755 *	63.966	18.398	134.546	0.998	0.997	42.075	-3.156 *	259.285	12.458	8.859
	420.C	28.43 *	19.125	17.032	17.270 *	63.823	18.123	144.406	0.986	0.983	41.956	-7.503 *	245.145	13.034	9.300
	430.C	29.10 *	19.045	16.766	17.993 *	63.724	17.784	154.266	0.974	0.959	41.810	-11.573 *	233.144	13.985	10.046
	440.C	29.56 *	18.964	16.464	18.909 *	63.645	17.382	164.126	0.960	0.928	41.641	-15.394 *	223.191	15.161	10.996
	450.C	30.94 *	18.872	16.127	20.009 *	63.567	16.923	173.986	0.945	0.891	41.451	-18.993 *	214.938	16.457	12.069
		*			*							*			
ECATE	TTIME	DV SLM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1

ECATE	TTIME	CV	SLM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMIC	VEL1	ALPHA1	*	PHI1	VINF1	DV1
123	380.C	34.19	*	19.C12	16.634	20.862	*	65.365	17.100	82.395	C.957	1.724	41.524	26.734	*	-21.385	20.061	15.179	
75	390.C	31.74	*	18.965	16.467	19.803	*	64.251	17.201	92.255	C.956	1.665	41.566	20.713	*	-31.783	17.294	12.777	
	400.C	29.78	*	18.927	16.330	19.055	*	63.428	17.259	102.115	C.955	1.603	41.590	15.030	*	-43.949	14.980	10.848	
	410.C	28.34	*	18.853	16.204	18.612	*	62.836	17.260	111.975	C.953	1.538	41.590	5.679	*	-58.086	13.228	9.450	
	420.C	27.47	*	18.856	16.071	18.461	*	62.420	17.198	121.835	C.950	1.470	41.564	4.650	*	-73.879	12.135	8.614	
	430.C	27.14	*	18.815	15.515	18.583	*	62.132	17.069	131.695	C.944	1.000	41.511	-0.072	*	269.745	11.741	8.320	
	440.C	27.27	*	18.767	15.740	18.956	*	61.931	16.871	141.555	C.937	C.994	41.430	-4.504	*	254.246	11.982	8.500	
	450.C	27.76	*	18.711	15.530	19.562	*	61.784	16.607	151.415	C.925	C.976	41.323	-8.666	*	240.669	12.711	9.051	
	460.C	28.52	*	18.647	15.286	20.384	*	61.663	16.280	161.275	C.915	C.950	41.153	-12.583	*	229.300	13.762	9.870	
	470.C	29.44	*	18.576	15.009	21.412	*	61.547	15.893	171.135	C.905	C.917	41.042	-16.282	*	219.914	15.002	10.865	
146	410.C	32.25	*	18.614	15.155	22.702	*	62.754	15.730	89.403	C.912	1.715	41.975	23.854	*	-24.877	18.296	13.636	
50	420.C	30.08	*	18.582	15.032	21.709	*	61.790	15.848	99.263	C.905	1.658	41.024	18.181	*	-35.724	15.767	11.494	
	430.C	28.38	*	18.554	14.924	21.036	*	61.085	15.914	109.123	C.906	1.554	41.050	12.785	*	-48.484	13.705	9.825	
	440.C	27.20	*	18.528	14.815	20.676	*	60.579	15.918	118.983	C.903	1.527	41.051	7.698	*	-63.254	12.219	8.677	
	450.C	26.57	*	18.498	14.703	20.612	*	60.219	15.856	128.843	C.900	1.458	41.027	2.907	*	-79.478	11.396	8.067	
	460.C	26.42	*	18.464	14.566	20.825	*	59.960	15.727	138.703	C.895	C.995	40.978	-1.602	*	264.156	11.250	7.961	
	470.C	26.71	*	18.424	14.402	21.296	*	59.765	15.532	148.563	C.885	C.985	40.903	-5.849	*	249.108	11.689	8.282	
	480.C	27.31	*	18.376	14.208	22.009	*	59.604	15.272	158.423	C.883	C.965	40.805	-5.855	*	236.200	12.555	8.932	
	490.C	28.14	*	18.322	13.983	22.950	*	59.451	14.951	168.283	C.876	C.940	40.686	-13.646	*	225.500	13.695	9.816	
	500.C	29.12	*	18.261	13.728	24.113	*	59.288	14.574	178.143	C.865	C.905	40.549	-17.248	*	216.682	14.992	10.857	
173	430.C	32.93	*	18.325	14.012	25.880	*	61.183	14.389	86.552	C.882	1.771	40.483	26.957	*	-18.987	19.407	14.604	
25	440.C	30.55	*	18.298	13.882	24.638	*	60.070	14.560	96.412	C.875	1.713	40.544	21.219	*	-28.674	16.725	12.295	
	450.C	28.67	*	18.275	13.784	23.718	*	59.252	14.684	106.272	C.870	1.650	40.585	15.782	*	-40.079	14.427	10.400	
	460.C	27.23	*	18.254	13.696	23.130	*	58.655	14.748	116.132	C.866	1.583	40.612	10.643	*	-53.519	12.615	8.978	
	470.C	26.30	*	18.233	13.605	22.862	*	58.223	14.747	125.992	C.862	1.515	40.612	5.750	*	-68.931	11.396	8.067	
	480.C	25.88	*	18.208	13.500	22.896	*	57.907	14.680	135.852	C.855	1.445	40.587	1.209	*	-85.469	10.842	7.667	
	490.C	25.51	*	18.175	13.373	23.214	*	57.665	14.546	145.712	C.855	C.997	40.535	-3.116	*	258.373	10.934	7.732	
	500.C	26.33	*	18.144	13.220	23.799	*	57.464	14.348	155.572	C.850	C.982	40.465	-7.205	*	243.939	11.554	8.182	
	510.C	27.03	*	18.103	13.035	24.637	*	57.276	14.088	165.432	C.846	C.960	40.377	-11.082	*	231.777	12.543	8.923	
	520.C	27.53	*	18.057	12.830	25.719	*	57.080	13.770	175.292	C.842	C.925	40.267	-14.771	*	221.761	13.763	9.870	
198	460.C	31.27	*	18.066	12.873	27.842	*	58.266	13.384	93.560	C.851	1.766	40.137	24.147	*	-22.659	17.792	13.203	
0	470.C	29.17	*	18.044	12.770	26.674	*	57.326	13.557	103.420	C.843	1.704	40.195	18.678	*	-32.839	15.320	11.126	
	480.C	27.50	*	18.026	12.685	25.846	*	56.636	13.673	112.280	C.837	1.635	40.234	13.493	*	-44.896	13.252	9.469	
	490.C	26.25	*	18.010	12.613	25.356	*	56.132	13.727	123.140	C.832	1.571	40.253	8.584	*	-59.083	11.693	8.285	
	500.C	25.55	*	17.992	12.533	25.187	*	55.764	13.718	133.000	C.825	1.511	40.250	3.936	*	-75.103	10.746	7.598	
	510.C	25.37	*	17.971	12.435	25.332	*	55.479	13.642	142.860	C.826	1.000	40.223	-0.462	*	268.224	10.457	7.395	
	520.C	25.56	*	17.946	12.316	25.771	*	55.241	13.500	152.720	C.822	C.993	40.176	-4.628	*	252.490	10.774	7.618	
	530.C	26.10	*	17.915	12.172	26.488	*	55.021	13.296	162.580	C.820	C.975	40.108	-8.584	*	238.808	11.559	8.186	
	540.C	26.85	*	17.880	12.003	27.473	*	54.794	13.034	172.440	C.817	C.945	40.021	-12.355	*	227.438	12.660	9.012	
	550.C	27.86	*	17.840	11.809	28.721	*	54.539	12.715	182.300	C.815	C.916	39.915	-15.564	*	218.102	13.952	10.020	
423	460.C	32.06	*	17.878	11.991	31.336	*	56.359	12.302	90.708	C.825	1.818	39.785	26.978	*	-17.495	18.925	14.183	
173	450.C	29.81	*	17.854	11.877	29.912	*	55.298	12.522	100.568	C.823	1.755	39.858	21.478	*	-26.638	16.326	11.960	
	500.C	27.55	*	17.837	11.794	28.831	*	54.519	12.688	110.428	C.815	1.654	39.910	16.251	*	-37.421	14.063	10.108	
	510.C	26.51	*	17.823	11.725	28.102	*	53.947	12.793	120.288	C.809	1.627	39.943	11.290	*	-50.244	12.228	8.684	
	520.C	25.54	*	17.810	11.657	27.721	*	53.524	12.833	130.148	C.804	1.557	39.956	6.585	*	-65.214	10.930	7.730	
	530.C	25.05	*	17.794	11.580	27.675	*	53.197	12.808	140.008	C.801	1.486	39.945	2.122	*	-81.710	10.258	7.256	
	540.C	25.01	*	17.776	11.488	27.948	*	52.926	12.719	149.868	C.795	C.956	39.920	-2.115	*	261.717	10.229	7.236	
	550.C	25.36	*	17.753	11.375	28.527	*	52.677	12.567	159.728	C.796	0.987	39.872	-6.146	*	246.617	10.756	7.606	
	560.C	26.01	*	17.727	11.241	29.392	*	52.428	12.357	169.588	C.795	C.966	39.806	-9.995	*	233.777	11.692	8.284	
	570.C	26.85	*	17.697	11.083	30.548	*	52.145	12.089	179.448	C.794	C.927	39.724	-13.680	*	223.214	12.891	9.190	
ECATE	TTIME	CV	SLM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	DV1



TABLE XI. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 JUPITER RADII CIRCULAR PARKING ORBIT

DATE	TIME	DV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	CV1
* * * * *																
446	500.0	32.53	*	17.725	11.230	35.112	*	54.335	11.307	87.857	0.825	1.865	35.493	29.716	*	-13.026
346	510.0	30.57	*	17.695	11.095	33.441	*	53.155	11.569	97.717	0.811	1.811	35.565	24.190	*	-21.307
	520.0	28.54	*	17.681	11.001	32.103	*	52.288	11.779	107.577	0.795	1.748	35.631	18.927	*	-30.981
	530.0	26.50	*	17.668	10.930	31.123	*	51.654	11.931	117.437	0.781	1.681	35.676	13.919	*	-42.485
	540.0	25.65	*	17.656	10.865	30.507	*	51.184	12.019	127.297	0.765	1.612	35.702	9.159	*	-56.162
	550.0	24.54	*	17.645	10.807	30.250	*	50.824	12.043	137.157	0.761	1.541	35.710	4.634	*	-71.890
	560.0	24.66	*	17.631	10.734	30.337	*	50.526	12.002	147.017	0.778	1.468	35.697	0.331	*	-88.678
	570.0	24.80	*	17.615	10.646	30.756	*	50.255	11.898	156.877	0.776	0.955	35.666	-3.770	*	255.113
	580.0	25.28	*	17.555	10.535	31.493	*	49.979	11.735	166.737	0.776	0.580	35.617	-7.687	*	240.825
	590.0	26.04	*	17.572	10.412	32.541	*	49.672	11.513	176.557	0.776	0.955	35.552	-11.443	*	228.903
* * * * *																
473	530.0	31.41	*	17.573	10.418	37.259	*	50.876	10.688	94.865	0.803	1.862	35.320	26.824	*	-16.688
223	540.0	29.24	*	17.553	10.306	35.665	*	49.932	10.941	104.725	0.789	1.801	35.350	21.525	*	-25.431
	550.0	27.43	*	17.535	10.226	34.429	*	49.241	11.135	114.585	0.778	1.725	35.444	16.476	*	-35.754
	560.0	26.01	*	17.528	10.164	33.566	*	48.733	11.268	124.445	0.770	1.667	35.482	11.665	*	-48.057
	570.0	25.02	*	17.518	10.109	33.079	*	48.347	11.336	134.305	0.765	1.596	35.501	7.084	*	-62.678
	580.0	24.50	*	17.508	10.045	32.961	*	48.031	11.341	144.165	0.761	1.523	35.502	2.719	*	-79.053
	590.0	24.41	*	17.496	9.980	33.200	*	47.744	11.283	154.025	0.755	0.955	35.486	-1.446	*	264.135
	600.0	24.71	*	17.481	9.896	33.785	*	47.454	11.164	163.885	0.755	0.950	35.452	-5.430	*	248.555
	610.0	25.32	*	17.464	9.795	34.704	*	47.132	10.987	173.745	0.755	0.970	35.402	-9.254	*	235.208
	620.0	26.18	*	17.444	9.675	35.954	*	46.755	10.756	183.605	0.761	0.942	35.335	-12.941	*	224.208
* * * * *																
458	550.0	32.30	*	17.472	9.845	41.330	*	48.459	9.877	92.014	0.800	1.913	35.107	25.378	*	-12.657
258	560.0	30.02	*	17.445	9.705	39.511	*	47.434	10.166	101.874	0.783	1.853	35.181	24.053	*	-20.620
	570.0	28.07	*	17.432	9.607	38.029	*	46.693	10.399	111.734	0.770	1.785	35.243	18.967	*	-29.925
	580.0	26.46	*	17.421	9.535	36.905	*	46.163	10.574	121.594	0.760	1.721	35.285	14.109	*	-41.029
	590.0	25.26	*	17.412	9.463	36.176	*	45.760	10.684	131.454	0.752	1.650	35.315	9.476	*	-54.313
	600.0	24.50	*	17.403	9.431	35.835	*	45.435	10.731	141.314	0.748	1.577	35.332	5.053	*	-69.786
	610.0	24.18	*	17.394	9.374	35.875	*	45.143	10.716	151.174	0.745	1.503	35.328	0.827	*	-86.598
	620.0	24.28	*	17.383	9.308	36.286	*	44.847	10.639	161.034	0.744	0.956	35.307	-3.219	*	256.886
	630.0	24.73	*	17.370	9.225	37.058	*	44.518	10.504	170.894	0.745	0.982	35.271	-7.106	*	242.161
	640.0	25.46	*	17.356	9.137	38.184	*	44.129	10.314	180.754	0.747	0.958	35.220	-10.855	*	229.825
* * * * *																
523	580.0	30.88	*	17.365	9.157	43.611	*	44.789	9.452	99.022	0.761	1.904	35.002	26.513	*	-16.419
273	590.0	28.75	*	17.346	9.075	41.891	*	44.017	9.723	108.882	0.765	1.841	35.069	21.392	*	-24.875
	600.0	27.03	*	17.332	8.990	40.528	*	43.463	9.933	118.742	0.753	1.774	35.122	16.495	*	-34.873
	610.0	25.63	*	17.323	8.928	39.545	*	43.060	10.083	128.602	0.744	1.704	35.160	11.813	*	-46.880
	620.0	24.65	*	17.315	8.876	38.969	*	42.736	10.169	138.462	0.737	1.631	35.182	7.337	*	-61.171
	630.0	24.11	*	17.307	8.827	38.793	*	42.449	10.193	148.322	0.734	1.557	35.188	3.055	*	-77.425
	640.0	23.55	*	17.295	8.773	39.011	*	42.158	10.157	158.182	0.732	1.000	35.175	-1.050	*	265.631
	650.0	24.26	*	17.290	8.711	39.616	*	41.831	10.062	168.042	0.732	0.951	35.154	-4.997	*	249.732
	660.0	24.85	*	17.279	8.635	40.599	*	41.441	9.911	177.902	0.734	0.972	35.116	-8.805	*	236.023
	670.0	25.70	*	17.266	8.557	41.956	*	40.962	9.707	187.762	0.727	0.945	35.065	-12.498	*	224.711
* * * * *																
548	600.0	31.77	*	17.255	8.776	47.937	*	41.973	8.791	96.170	0.762	1.955	34.847	28.911	*	-12.710
248	610.0	29.58	*	17.277	8.625	46.009	*	41.186	9.097	106.030	0.764	1.893	34.918	23.759	*	-20.458
	620.0	27.68	*	17.261	8.518	44.410	*	40.635	9.344	115.890	0.745	1.827	34.976	18.824	*	-29.521
	630.0	26.12	*	17.245	8.442	43.188	*	40.237	9.529	125.750	0.738	1.757	35.021	14.100	*	-40.348
	640.0	24.54	*	17.241	8.384	42.372	*	39.926	9.651	135.610	0.730	1.685	35.051	9.576	*	-53.366
	650.0	24.18	*	17.234	8.337	41.960	*	39.663	9.713	145.470	0.725	1.610	35.066	5.239	*	-68.665
	660.0	23.85	*	17.227	8.251	41.969	*	39.389	9.714	155.330	0.722	1.534	35.066	1.079	*	-85.474
	670.0	23.52	*	17.220	8.241	42.397	*	39.075	9.656	165.190	0.722	0.957	35.052	-2.924	*	257.822
	680.0	24.36	*	17.212	8.185	43.207	*	38.694	9.543	175.050	0.723	0.982	35.024	-6.788	*	242.813
	690.0	25.08	*	17.203	8.122	44.424	*	38.217	9.376	184.910	0.726	0.960	34.984	-10.536	*	230.204
* * * * *																
DATE	TIME	DV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	CV1

ECATE	TTIME	CV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1
573	620.C	32.65	*	17.245	8.440	52.433 *	38.971	8.182	93.319	0.786	2.005	38.714	31.250 *	-9.406	20.358	15.441
222	630.C	30.42	*	17.222	8.255	50.345 *	38.191	8.520	103.179	0.765	1.544	38.787	26.072 *	-16.563	17.785	13.197
	640.C	28.40	*	17.203	8.120	48.537 *	37.663	8.800	113.039	0.748	1.879	38.849	21.103 *	-24.837	15.413	11.202
	650.C	26.70	*	17.185	8.025	47.080 *	37.296	9.019	122.899	0.725	1.810	38.900	18.337 *	-34.637	13.299	9.506
	660.C	25.34	*	17.180	7.956	46.020 *	37.020	9.176	132.759	0.725	1.138	38.936	11.768 *	-46.431	11.521	8.159
	670.C	24.38	*	17.173	7.903	45.381 *	36.780	9.272	142.619	0.718	1.663	38.959	7.384 *	-60.544	10.182	7.204
	680.C	23.83	*	17.166	7.858	45.172 *	36.532	9.307	152.479	0.714	1.587	38.967	3.173 *	-76.719	9.389	6.667
	690.C	23.71	*	17.161	7.817	45.378 *	36.253	9.285	162.335	0.713	1.000	38.962	-0.885 *	266.251	9.207	6.548
	700.C	23.97	*	17.155	7.773	46.016 *	35.892	9.207	172.199	0.714	0.552	38.944	-4.802 *	250.161	9.607	6.813
	710.C	24.55	*	17.148	7.725	47.073 *	35.430	9.076	182.059	0.716	0.573	38.913	-8.601 *	236.235	10.471	7.405

TABLE XI. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 JUPITER RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	CV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1
558	66C.C	25.06	*	17.158	7.796	52.664 *	34.600	8.326	110.760	C.745	1.525	3E.745	23.029 *	-21.225	16.260	11.905
155	670.C	27.24	*	17.142	7.677	51.031 *	34.283	8.572	120.620	0.734	1.857	3E.798	18.239 *	-30.240	14.056	10.103
	68C.C	25.75	*	17.131	7.594	49.756 *	34.070	8.758	130.480	C.722	1.785	3E.840	13.636 *	-41.055	12.143	8.620
	690.C	24.63	*	17.123	7.533	48.907 *	33.880	8.882	140.340	C.714	1.711	3E.866	9.216 *	-54.091	10.613	7.505
	70C.C	23.51	*	17.116	7.466	48.493 *	33.677	8.947	150.200	C.705	1.634	3E.882	4.965 *	-69.431	9.577	6.793
	710.C	23.61	*	17.111	7.446	48.523 *	33.422	8.953	160.060	C.706	1.555	3E.864	0.868 *	-86.298	9.129	6.497
	72C.C	23.71	*	17.107	7.410	48.984 *	33.095	8.906	169.920	C.706	C.556	3E.873	-3.093 *	256.947	9.287	6.600
	73C.C	24.16	*	17.102	7.373	49.890 *	32.653	8.804	179.780	C.706	C.562	3E.850	-6.934 *	241.932	9.968	7.057
	740.C	24.51	*	17.097	7.337	51.228 *	32.075	8.652	189.640	C.712	C.555	3E.816	-10.679 *	229.338	11.039	7.808
	75C.C	25.85	*	17.093	7.303	52.992 *	31.337	8.453	199.500	C.715	C.526	3E.772	-14.350 *	219.038	12.372	8.793
622	65C.C	27.64	*	17.104	7.392	55.126 *	31.168	8.166	118.341	C.724	1.504	3E.711	20.055 *	-26.337	14.841	10.734
175	70C.C	26.22	*	17.091	7.288	53.679 *	31.018	8.377	128.201	C.721	1.633	3E.756	15.465 *	-36.269	12.817	9.133
	71C.C	24.55	*	17.082	7.215	52.624 *	30.899	8.529	138.061	C.711	1.758	3E.789	11.010 *	-48.267	11.129	7.873
	72C.C	24.07	*	17.075	7.161	52.007 *	30.755	8.620	147.921	C.704	1.661	3E.809	6.722 *	-62.622	9.879	6.996
	73C.C	23.60	*	17.070	7.120	51.841 *	30.551	8.655	157.781	C.701	1.602	3E.817	2.587 *	-78.994	9.176	6.528
	740.C	23.52	*	17.066	7.086	52.130 *	30.256	8.634	167.641	C.700	C.555	3E.812	-1.412 *	263.953	9.081	6.466
	75C.C	23.64	*	17.062	7.057	52.873 *	29.843	8.560	177.501	C.701	C.550	3E.796	-5.293 *	248.004	9.556	6.778
	760.C	24.47	*	17.055	7.033	54.053 *	29.296	8.437	187.361	C.705	C.570	3E.765	-9.079 *	234.298	10.483	7.413
	770.C	25.37	*	17.056	7.012	55.684 *	28.570	8.266	197.221	C.711	C.541	3E.732	-12.788 *	223.022	11.727	8.310
	78C.C	26.47	*	17.055	7.000	57.748 *	27.647	8.051	207.081	C.715	C.504	3E.686	-16.448 *	213.802	13.182	9.415
647	71C.C	26.58	*	17.076	7.166	55.543 *	27.854	7.775	115.489	C.727	1.555	3E.630	22.206 *	-22.323	15.783	11.507
150	720.C	26.84	*	17.060	7.037	57.924 *	27.798	8.013	125.349	0.722	1.884	3E.679	17.539 *	-31.384	13.654	9.784
	73C.C	25.42	*	17.046	6.545	56.664 *	27.765	8.193	135.209	C.710	1.610	3E.716	13.044 *	-42.285	11.812	8.373
	740.C	24.36	*	17.040	6.879	55.823 *	27.700	8.313	145.069	0.702	1.733	3E.742	8.713 *	-55.456	10.350	7.320
	75C.C	23.70	*	17.035	6.832	55.430 *	27.567	8.377	154.925	0.657	1.654	3E.756	4.532 *	-70.942	9.378	6.661
	760.C	23.44	*	17.031	6.798	55.500 *	27.335	8.385	164.789	0.655	1.572	3E.758	0.487 *	-87.899	8.992	6.409
	77C.C	23.58	*	17.028	6.773	56.036 *	26.975	8.342	174.645	C.655	C.556	3E.748	-3.438 *	255.379	9.206	6.548
	78C.C	24.06	*	17.026	6.755	57.036 *	26.463	8.248	184.509	C.658	C.581	3E.728	-7.265 *	240.474	9.938	7.036
	79C.C	24.64	*	17.024	6.745	58.493 *	25.771	8.107	194.365	C.703	C.556	3E.698	-11.014 *	228.017	11.052	7.818
	80C.C	25.66	*	17.024	6.746	60.383 *	24.885	7.923	204.225	C.711	C.522	3E.660	-14.711 *	217.827	12.425	8.837
672	73C.C	29.37	*	17.055	7.003	64.037 *	24.407	7.419	112.638	C.742	2.005	3E.560	24.282 *	-18.737	16.744	12.311
125	740.C	27.52	*	17.036	6.845	62.283 *	24.480	7.683	122.498	C.725	1.525	3E.612	19.580 *	-27.056	14.529	10.482
	75C.C	25.56	*	17.022	6.725	60.860 *	24.546	7.887	132.358	C.711	1.662	3E.653	15.048 *	-36.981	12.563	8.938
	76C.C	24.74	*	17.013	6.647	59.809 *	24.583	8.035	142.218	C.701	1.785	3E.683	10.675 *	-49.002	10.923	7.725
	77C.C	23.85	*	17.006	6.585	59.198 *	24.537	8.125	152.078	C.655	1.706	3E.702	6.452 *	-63.407	9.715	6.885
	780.C	23.45	*	17.002	6.551	59.047 *	24.381	8.162	161.938	C.651	1.624	3E.710	2.364 *	-79.838	9.049	6.445
	79C.C	23.40	*	16.999	6.526	59.367 *	24.090	8.146	171.798	C.651	C.555	3E.706	-1.605 *	263.072	8.987	6.405
	80C.C	23.73	*	16.997	6.512	60.161 *	23.637	8.081	181.658	0.653	C.589	3E.693	-5.473 *	247.125	9.493	6.737
	810.C	24.35	*	16.997	6.505	61.424 *	22.997	7.969	191.518	0.657	C.568	3E.670	-5.260 *	233.455	10.450	7.390
	82C.C	25.31	*	16.998	6.518	63.144 *	22.143	7.812	201.378	C.704	C.535	3E.638	-12.990 *	222.213	11.726	8.310
657	76C.C	28.24	*	17.020	6.705	66.695 *	21.066	7.384	119.646	C.725	1.566	3E.553	21.588 *	-23.198	15.432	11.218
100	770.C	26.56	*	17.004	6.566	65.139 *	21.264	7.612	129.506	0.714	1.513	3E.598	17.021 *	-32.280	13.364	9.556
	780.C	25.15	*	16.992	6.463	63.933 *	21.403	7.783	139.366	C.702	1.637	3E.632	12.612 *	-43.230	11.577	8.199
	79C.C	24.18	*	16.984	6.392	63.111 *	21.467	7.899	149.226	C.654	1.757	3E.655	8.347 *	-56.493	10.165	7.192
	80C.C	23.55	*	16.978	6.343	62.754 *	21.396	7.961	159.086	0.685	1.676	3E.668	4.220 *	-72.070	9.242	6.571
	810.C	23.33	*	16.975	6.315	62.847 *	21.194	7.972	168.946	0.687	1.552	3E.670	0.208 *	-89.094	8.901	6.350
	82C.C	23.45	*	16.974	6.302	63.427 *	20.814	7.933	178.806	C.658	C.555	3E.662	-3.699 *	254.195	9.158	6.516
	830.C	24.00	*	16.974	6.303	64.483 *	20.239	7.848	188.666	C.652	C.575	3E.645	-7.524 *	239.359	9.928	7.030
	84C.C	24.81	*	16.976	6.315	66.005 *	19.443	7.719	198.526	C.658	C.553	3E.615	-11.288 *	226.585	11.081	7.838
	850.C	25.87	*	16.975	6.352	67.973 *	18.397	7.549	208.386	C.706	C.515	3E.585	-15.015 *	216.872	12.496	8.887
ECATE	TTIME	CV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1

ECATE	TTIME	CV	SLM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMIC	VEL1	ALPHA1	*	PHI1	VINF1	CV1
722 75	76C.C	28.59	*		17.010	6.625	71.109	*	17.550	7.114	116.795	C.735	2.C36	3E.503	23.568	*	-19.728	16.355	11.984
	75C.C	27.21	*		16.951	6.455	69.450	*	17.920	7.364	126.655	C.71E	1.9E3	3E.550	18.965	*	-28.091	14.201	10.219
	80C.C	25.71	*		16.977	6.32E	68.110	*	18.191	7.557	136.515	C.704	1.88E	3E.587	14.520	*	-38.094	12.293	8.733
	810.C	24.54	*		16.967	6.238	67.138	*	18.356	7.696	146.375	C.695	1.80E	3E.614	10.221	*	-50.225	10.710	7.573
	820.C	23.74	*		16.960	6.178	66.561	*	18.407	7.782	156.235	C.68E	1.727	3E.631	6.051	*	-64.779	9.557	6.779
	830.C	23.34	*		16.956	6.141	66.454	*	18.291	7.817	166.095	C.6E5	1.643	3E.635	2.003	*	-81.318	8.947	6.380
	840.C	23.32	*		16.954	6.125	66.814	*	17.999	7.804	175.955	C.6E5	C.595	3E.63E	-1.943	*	261.575	8.940	6.375
	850.C	23.65	*		16.955	6.126	67.655	*	17.502	7.744	185.815	C.6E7	C.5E7	3E.624	-5.803	*	245.715	9.496	6.739
	860.C	24.3E	*		16.957	6.145	68.966	*	16.778	7.641	195.675	C.692	C.566	3E.603	-9.600	*	232.176	10.498	7.424
	870.C	25.34	*		16.961	6.184	70.730	*	15.797	7.497	205.535	C.70C	C.535	3E.575	-13.356	*	221.057	11.817	8.377
147 50	810.C	27.9C	*		16.9E4	6.352	73.759	*	14.495	7.142	123.803	C.723	2.C14	3E.50E	20.887	*	-24.328	15.067	10.919
	820.C	26.29	*		16.967	6.235	72.316	*	14.931	7.356	132.663	C.70E	1.93E	3E.548	16.407	*	-33.506	13.058	9.318
	830.C	24.67	*		16.955	6.12E	71.190	*	15.242	7.515	142.522	C.69E	1.8E0	3E.575	12.069	*	-44.604	11.330	8.019
	840.C	24.C1	*		16.947	6.051	70.450	*	15.404	7.623	152.383	C.68E	1.77E	3E.600	7.864	*	-58.045	9.979	7.064
	850.C	23.43	*		16.942	6.003	70.145	*	15.395	7.681	162.243	C.6E4	1.694	3E.611	3.779	*	-73.797	9.119	6.491
	860.C	23.25	*		16.935	5.980	70.295	*	15.200	7.691	172.103	C.6E2	1.000	3E.613	-0.203	*	269.114	8.844	6.313
	870.C	23.4E	*		16.939	5.975	70.918	*	14.793	7.655	182.963	C.6E4	C.594	3E.60E	-4.098	*	252.475	9.163	6.519
	880.C	24.C1	*		16.941	5.95E	72.013	*	14.152	7.576	192.823	C.6E8	C.577	3E.591	-7.927	*	237.802	9.988	7.070
	890.C	24.6E	*		16.945	6.040	73.562	*	13.250	7.457	202.683	C.695	C.590	3E.567	-11.711	*	225.603	11.189	7.916
	900.C	25.9E	*		16.952	6.107	75.540	*	12.058	7.300	212.543	C.704	C.514	3E.537	-15.474	*	215.634	12.651	9.005
172 25	830.C	28.E3	*		16.982	6.374	77.951	*	11.044	6.946	120.952	C.725	2.CE3	3E.472	22.781	*	-20.941	15.950	11.646
	840.C	26.91	*		16.962	6.194	76.480	*	11.640	7.177	130.812	C.712	1.585	3E.514	18.270	*	-29.396	13.859	9.946
	850.C	25.47	*		16.947	6.055	75.256	*	12.101	7.356	140.672	C.699	1.510	3E.54E	13.895	*	-39.559	12.010	8.521
	860.C	24.3E	*		16.937	5.963	74.371	*	12.397	7.483	150.532	C.690	1.825	3E.572	5.658	*	-51.907	10.490	7.418
	870.C	23.61	*		16.931	5.901	73.885	*	12.511	7.562	160.392	C.6E4	1.744	3E.58E	5.537	*	-66.681	9.406	6.679
	880.C	23.2E	*		16.927	5.868	73.843	*	12.419	7.593	170.252	C.6E1	1.657	3E.594	1.521	*	-83.366	8.870	6.330
	890.C	23.30	*		16.927	5.861	74.249	*	12.116	7.580	180.112	C.6E1	C.59E	3E.591	-2.408	*	259.546	8.935	6.372
	900.C	23.71	*		16.928	5.877	75.133	*	11.562	7.524	189.972	C.6E4	C.5E5	3E.580	-E.266	*	243.860	9.557	6.779
	910.C	24.44	*		16.933	5.919	76.454	*	10.757	7.428	199.832	C.690	C.5E2	3E.562	-10.078	*	230.538	10.617	7.507
	920.C	25.44	*		16.940	5.987	78.212	*	9.652	7.294	209.692	C.69E	C.520	3E.53E	-13.864	*	219.616	11.987	8.503
197 C	860.C	27.57	*		16.961	6.150	80.533	*	8.339	7.020	127.960	C.71E	2.C35	3E.485	20.111	*	-25.701	14.686	10.609
	870.C	26.02	*		16.944	6.030	79.266	*	8.954	7.215	137.820	C.702	1.961	3E.521	15.709	*	-35.035	12.738	9.072
	880.C	24.77	*		16.932	5.913	78.274	*	9.396	7.361	147.680	C.692	1.875	3E.545	11.435	*	-46.358	11.074	7.833
	890.C	23.8E	*		16.924	5.834	77.638	*	9.640	7.458	157.540	C.685	1.795	3E.568	7.280	*	-60.065	9.793	6.938
	900.C	23.34	*		16.915	5.78E	77.410	*	9.671	7.510	167.400	C.6E0	1.70E	3E.578	3.230	*	-76.045	9.012	6.421
	910.C	23.22	*		16.918	5.771	77.627	*	9.469	7.517	177.260	C.675	1.000	3E.575	-0.730	*	266.806	8.819	6.298
	920.C	23.47	*		16.915	5.7E2	78.281	*	9.031	7.482	187.120	C.6E1	C.592	3E.572	-4.620	*	250.300	9.216	6.554
	930.C	24.0E	*		16.923	5.821	79.391	*	8.317	7.408	196.980	C.6E6	C.573	3E.55E	-8.457	*	235.879	10.109	7.153
	940.C	24.5E	*		16.929	5.8E7	80.923	*	7.312	7.297	206.840	C.694	C.545	3E.537	-12.266	*	223.931	11.368	8.046
	950.C	26.12	*		16.940	5.96E	82.850	*	5.980	7.151	216.700	C.704	C.507	3E.509	-16.070	*	214.164	12.883	9.183
222 273	860.C	28.27	*		16.965	6.224	84.460	*	5.007	6.883	125.108	C.724	2.CE6	3E.461	21.535	*	-22.348	15.534	11.301
	890.C	26.61	*		16.945	6.037	83.161	*	5.817	7.094	134.968	C.70E	2.011	3E.495	17.499	*	-30.968	13.501	9.664
	900.C	25.23	*		16.931	5.85E	82.112	*	6.405	7.255	144.828	C.69E	1.530	3E.529	13.195	*	-41.356	11.717	8.302
	910.C	24.1E	*		16.920	5.795	81.359	*	6.790	7.370	154.688	C.6E7	1.84E	3E.551	9.007	*	-53.995	10.266	7.262
	920.C	23.50	*		16.914	5.738	80.974	*	6.950	7.439	164.548	C.6E1	1.75E	3E.564	4.924	*	-69.061	9.263	6.585
	930.C	23.21	*		16.911	5.710	80.998	*	6.873	7.466	174.408	C.675	1.66E	3E.565	0.933	*	-85.916	8.816	6.296
	940.C	23.31	*		16.912	5.712	81.465	*	6.533	7.451	184.268	C.675	C.597	3E.56E	-2.983	*	257.071	8.971	6.395
	950.C	23.77	*		16.915	5.745	82.347	*	5.936	7.397	194.128	C.6E3	C.5E2	3E.556	-6.848	*	241.624	9.673	6.857
	960.C	24.5E	*		16.921	5.80E	83.658	*	5.037	7.307	203.988	C.690	C.55E	3E.535	-10.678	*	228.605	10.799	7.636
	970.C	25.61	*		16.931	5.904	85.367	*	3.806	7.183	213.848	C.695	C.524	3E.515	-14.498	*	217.945	12.227	8.684
ECATE	TTIME	CV	SLM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMIC	VEL1	ALPHA1	*	PHI1	VINF1	CV1

TABLE XI. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

PARKING ORBIT TO 1.1 JUPITER RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	CV	SUM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMIC	VEL1	ALPHA1	*	PHI1	VINF1	DV1
847	900.C	28.95	*	*	16.573	6.292	88.190	*	1.683	6.766	122.257	C.722	2.127	38.440	23.738	*	-19.295	16.395	12.018
248	910.C	27.24	*	*	16.950	6.075	86.928	*	2.672	6.989	132.117	C.714	2.060	38.480	19.275	*	-27.288	14.293	10.292
	920.C	25.75	*	*	16.932	5.515	85.829	*	3.443	7.165	141.977	C.700	1.980	38.512	14.937	*	-36.854	12.406	8.819
	930.C	24.57	*	*	16.920	5.756	85.005	*	3.967	7.295	151.837	C.685	1.856	38.536	10.719	*	-48.473	10.811	7.645
	940.C	23.73	*	*	16.912	5.717	84.493	*	4.263	7.381	161.697	C.682	1.805	38.553	6.606	*	-62.519	9.611	6.815
	950.C	23.27	*	*	16.908	5.675	84.354	*	4.312	7.425	171.557	C.675	1.715	38.561	2.584	*	-78.764	8.923	6.364
	960.C	23.21	*	*	16.907	5.667	84.621	*	4.101	7.429	181.417	C.678	C.695	38.562	-1.362	*	264.043	8.829	6.304
	970.C	23.53	*	*	16.910	5.691	85.305	*	3.612	7.394	191.277	C.681	C.690	38.555	-5.250	*	247.751	9.317	6.620
	980.C	24.15	*	*	16.915	5.748	86.403	*	2.823	7.324	201.137	C.686	C.685	38.542	-9.101	*	233.658	10.287	7.277
	990.C	25.15	*	*	16.925	5.840	87.878	*	1.716	7.219	210.997	C.694	C.695	38.522	-12.935	*	222.026	11.612	8.225
872	920.C	27.51	*	*	16.957	6.151	90.504	*	-0.449	6.901	129.265	C.720	2.110	38.464	21.032	*	-23.948	15.105	10.949
223	940.C	26.31	*	*	16.937	5.963	89.421	*	0.487	7.089	139.125	C.705	2.030	38.498	16.667	*	-32.781	13.133	9.377
	950.C	25.00	*	*	16.923	5.822	88.529	*	1.184	7.233	148.985	C.692	1.946	38.525	12.416	*	-43.474	11.414	8.080
	960.C	24.02	*	*	16.913	5.724	87.933	*	1.613	7.334	158.845	C.685	1.855	38.544	8.275	*	-56.473	10.043	7.108
	970.C	23.41	*	*	16.907	5.666	87.658	*	1.795	7.394	168.705	C.675	1.765	38.555	4.224	*	-71.884	9.133	6.500
	980.C	23.18	*	*	16.905	5.645	87.755	*	1.709	7.414	178.565	C.678	1.676	38.555	0.251	*	-88.899	8.790	6.279
	990.C	23.35	*	*	16.906	5.655	88.245	*	1.342	7.397	188.425	C.675	C.695	38.556	-3.662	*	254.207	9.049	6.445
	1000.C	23.88	*	*	16.911	5.708	89.130	*	0.676	7.345	198.285	C.682	C.675	38.546	-7.535	*	239.093	9.840	6.970
	1010.C	24.73	*	*	16.920	5.792	90.396	*	-0.316	7.260	208.145	C.691	C.692	38.530	-11.389	*	226.441	11.041	7.809
	1020.C	25.85	*	*	16.932	5.914	91.999	*	-1.655	7.144	218.005	C.701	C.616	38.508	-15.250	*	216.084	12.533	8.916
897	950.C	28.60	*	*	16.968	6.252	93.865	*	-3.539	6.827	126.414	C.728	2.158	38.451	22.773	*	-20.898	15.932	11.631
258	960.C	26.51	*	*	16.945	6.039	92.829	*	-2.431	7.026	136.274	C.711	2.075	38.486	18.381	*	-29.092	13.888	9.970
	970.C	25.45	*	*	16.928	5.875	91.934	*	-1.582	7.182	146.134	C.697	1.956	38.515	14.104	*	-38.942	12.066	8.563
	980.C	24.37	*	*	16.916	5.757	91.251	*	-0.987	7.297	155.994	C.688	1.905	38.537	9.930	*	-50.942	10.546	7.458
	990.C	23.61	*	*	16.905	5.681	90.880	*	-0.678	7.372	165.854	C.681	1.815	38.551	5.853	*	-65.384	9.438	6.700
	1000.C	23.23	*	*	16.905	5.645	90.831	*	-0.633	7.408	175.714	C.678	1.726	38.558	1.853	*	-81.906	8.856	6.321
	1010.C	23.24	*	*	16.905	5.647	91.159	*	-0.883	7.407	185.574	C.678	C.695	38.558	-2.082	*	260.916	8.873	6.332
	1020.C	23.63	*	*	16.909	5.685	91.836	*	-1.416	7.372	195.434	C.681	C.687	38.551	-5.978	*	244.902	9.465	6.718
	1030.C	24.36	*	*	16.917	5.761	92.891	*	-2.280	7.304	205.294	C.687	C.664	38.538	-9.849	*	231.205	10.521	7.440
	1040.C	25.26	*	*	16.928	5.876	94.293	*	-3.499	7.206	215.154	C.697	C.621	38.520	-13.720	*	219.944	11.916	8.450
922	980.C	27.55	*	*	16.956	6.140	96.035	*	-5.310	6.976	132.422	C.717	2.128	38.477	20.081	*	-25.735	14.666	10.592
273	990.C	26.02	*	*	16.936	5.953	95.163	*	-4.301	7.143	143.282	0.703	2.045	38.508	15.777	*	-34.838	12.756	9.086
	1000.C	24.78	*	*	16.922	5.814	94.459	*	-3.565	7.269	153.142	C.691	1.955	38.531	11.577	*	-45.893	11.110	7.859
	1010.C	23.67	*	*	16.912	5.715	93.996	*	-3.105	7.357	163.002	C.682	1.865	38.548	7.471	*	-59.328	9.825	6.960
	1020.C	23.33	*	*	16.907	5.667	93.827	*	-2.927	7.407	172.862	C.675	1.776	38.558	3.446	*	-75.114	9.021	6.427
	1030.C	23.15	*	*	16.906	5.654	93.989	*	-3.038	7.422	182.722	C.678	1.600	38.561	-0.515	*	267.741	8.796	6.283
	1040.C	23.42	*	*	16.908	5.681	94.510	*	-3.460	7.402	192.582	C.680	C.692	38.557	-4.428	*	251.054	9.168	6.523
	1050.C	24.03	*	*	16.915	5.746	95.359	*	-4.186	7.351	202.442	C.685	C.674	38.547	-8.317	*	236.334	10.058	7.119
	1060.C	24.55	*	*	16.926	5.851	96.546	*	-5.265	7.269	212.302	C.692	C.645	38.531	-12.201	*	224.098	11.339	8.026
	1070.C	26.14	*	*	16.941	5.999	98.022	*	-6.714	7.161	222.162	0.704	C.606	38.511	-16.107	*	214.083	12.900	9.197
947	1000.C	28.21	*	*	16.965	6.263	99.042	*	-8.156	6.937	130.570	C.724	2.177	38.470	21.765	*	-22.661	15.461	11.241
248	1010.C	26.55	*	*	16.947	6.053	98.204	*	-6.975	7.113	140.430	0.708	2.095	38.502	17.437	*	-31.110	13.476	9.644
	1020.C	25.24	*	*	16.930	5.893	97.499	*	-6.089	7.250	150.290	C.696	2.008	38.528	13.211	*	-41.309	11.722	8.307
	1030.C	24.15	*	*	16.918	5.778	96.985	*	-5.486	7.350	160.150	C.686	1.915	38.547	9.079	*	-53.743	10.285	7.275
	1040.C	23.51	*	*	16.911	5.708	96.722	*	-5.171	7.413	170.010	C.681	1.825	38.555	5.029	*	-68.636	9.278	6.594
	1050.C	23.20	*	*	16.908	5.680	96.754	*	-5.150	7.441	179.870	C.678	1.725	38.564	1.045	*	-85.425	8.816	6.296
	1060.C	23.30	*	*	16.910	5.693	97.106	*	-5.434	7.436	189.730	C.675	C.697	38.563	-2.890	*	257.466	8.958	6.386
	1070.C	23.76	*	*	16.915	5.746	97.794	*	-6.044	7.400	199.590	C.682	C.683	38.556	-6.792	*	241.830	9.660	6.848
	1080.C	24.57	*	*	16.925	5.840	98.780	*	-6.981	7.334	209.450	C.690	C.658	38.544	-10.690	*	228.584	10.808	7.642
	1090.C	25.66	*	*	16.935	5.976	100.059	*	-8.290	7.241	219.310	C.700	C.652	38.526	-14.602	*	217.719	12.278	8.722
ECATE	TTIME	DV	SUM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	DV1

ECATE	TTIME	DV	SLM *	DV2	VINF2	PHI2 *	ALPHA2	VEL 2	BETA	ECCE	RMID	VEL 1	ALPHA1 *	PHI1	VINF1	CV1
972	1020.C	28.90	*	16.985	6.405	101.830	* -10.956	6.909	127.719	C.732	2.222	36.465	23.444 *	-19.833	16.268	11.912
223	1030.C	27.19	*	16.960	6.173	101.058	* -9.611	7.092	137.579	C.715	2.144	36.498	19.088 *	-27.707	14.220	10.234
	1040.C	25.74	*	16.940	5.991	100.368	* -8.566	7.239	147.439	C.701	2.058	36.526	14.835 *	-37.141	12.374	8.795
	1050.C	24.57	*	16.926	5.857	99.831	* -7.821	7.349	157.299	C.690	1.968	36.547	10.678 *	-48.627	10.806	7.641
	1060.C	23.74	*	16.917	5.768	99.500	* -7.368	7.424	167.159	C.683	1.875	36.561	6.603 *	-62.547	9.618	6.820
	1070.C	23.28	*	16.913	5.723	99.426	* -7.214	7.465	177.019	C.675	1.775	36.569	2.596 *	-78.719	8.932	6.370
	1080.C	23.22	*	16.913	5.721	99.641	* -7.366	7.473	186.879	C.675	C.995	36.570	-1.358 *	264.064	8.837	6.309
	1090.C	23.55	*	16.917	5.761	100.158	* -7.837	7.451	196.739	C.682	C.990	36.566	-5.278 *	247.657	9.333	6.631
	1100.C	24.23	*	16.925	5.843	100.981	* -8.650	7.400	206.599	C.687	C.965	36.556	-9.186 *	233.414	10.326	7.304
	1110.C	25.22	*	16.938	5.965	102.068	* -9.813	7.322	216.459	C.696	C.937	36.541	-13.105 *	221.632	11.692	8.284

TABLE XI. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 JUPITER RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	CV	SLM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	DV1
956 155	1050.C	27.72	*	16.973	6.256	103.612	*	-12.065	7.089	135.300	C.720	2.187	38.498	20.466	*	-25.073	14.861	10.751	
	1060.C	26.15	*	16.951	6.096	102.967	*	-10.888	7.241	145.160	0.705	2.101	38.526	16.195	*	-33.925	12.950	9.235	
	1070.C	24.52	*	16.935	5.944	102.432	*	-10.014	7.359	155.020	C.654	2.012	38.548	12.018	*	-44.667	11.285	7.986	
	1080.C	23.56	*	16.925	5.839	102.071	*	-9.443	7.442	164.880	0.686	1.915	38.565	7.923	*	-57.752	9.963	7.053	
	1090.C	23.40	*	16.918	5.775	101.927	*	-9.172	7.493	174.740	C.681	1.822	38.574	3.898	*	-73.253	9.101	6.479	
	1100.C	23.21	*	16.917	5.764	102.043	*	-9.212	7.512	184.600	0.675	1.000	38.578	-0.073	*	269.681	8.808	6.291	
	1110.C	23.41	*	16.920	5.791	102.436	*	-9.571	7.501	194.460	C.681	C.554	38.576	-4.008	*	252.801	9.119	6.491	
	1120.C	23.56	*	16.927	5.862	103.108	*	-10.264	7.462	204.320	C.686	C.577	38.568	-7.928	*	237.745	9.968	7.056	
	1130.C	24.65	*	16.935	5.978	104.052	*	-11.317	7.396	214.180	C.654	C.548	38.556	-11.854	*	225.157	11.231	7.947	
	1140.C	26.07	*	16.956	6.140	105.216	*	-12.741	7.307	224.040	C.705	C.510	38.535	-15.814	*	214.838	12.796	9.116	
1021 175	1080.C	26.66	*	16.964	6.214	105.356	*	-13.151	7.251	142.881	C.711	2.145	38.528	17.543	*	-30.957	13.542	9.696	
	1090.C	25.31	*	16.946	6.045	104.877	*	-12.147	7.375	152.741	C.698	2.055	38.552	13.346	*	-41.017	11.794	8.360	
	1100.C	24.26	*	16.933	5.922	104.505	*	-11.462	7.466	162.601	C.685	1.962	38.565	9.234	*	-53.286	10.353	7.322	
	1110.C	23.55	*	16.925	5.848	104.309	*	-11.074	7.525	172.461	C.683	1.866	38.581	5.190	*	-68.031	9.330	6.629	
	1120.C	23.24	*	16.922	5.818	104.343	*	-11.001	7.554	182.321	C.680	1.766	38.586	1.203	*	-84.745	8.845	6.314	
	1130.C	23.31	*	16.924	5.833	104.632	*	-11.249	7.553	192.181	0.681	C.557	38.586	-2.746	*	258.099	8.964	6.391	
	1140.C	23.77	*	16.930	5.892	105.175	*	-11.827	7.525	202.041	C.685	C.583	38.580	-6.677	*	242.311	9.654	6.844	
	1150.C	24.58	*	16.941	5.956	105.969	*	-12.757	7.471	211.901	0.692	C.558	38.570	-10.612	*	228.893	10.804	7.640	
	1160.C	25.65	*	16.957	6.146	106.995	*	-14.066	7.394	221.761	C.702	C.523	38.555	-14.574	*	217.870	12.290	8.731	
	1170.C	27.05	*	16.979	6.349	108.194	*	-15.768	7.295	231.621	C.715	C.678	38.536	-18.594	*	208.799	14.022	10.076	
1046 150	1100.C	27.25	*	16.980	6.358	107.744	*	-15.480	7.260	140.025	C.717	2.153	38.530	19.137	*	-27.695	14.266	10.270	
	1110.C	25.80	*	16.955	6.169	107.262	*	-14.340	7.391	149.889	0.702	2.105	38.555	14.918	*	-37.021	12.431	8.838	
	1120.C	24.63	*	16.944	6.028	106.874	*	-13.509	7.490	159.745	C.693	2.012	38.574	10.782	*	-48.383	10.865	7.683	
	1130.C	23.75	*	16.934	5.935	106.644	*	-12.995	7.559	169.609	C.685	1.915	38.587	6.719	*	-62.172	9.671	6.855	
	1140.C	23.32	*	16.929	5.887	106.599	*	-12.787	7.598	179.465	C.682	1.815	38.595	2.712	*	-78.254	8.969	6.394	
	1150.C	23.25	*	16.929	5.885	106.773	*	-12.898	7.609	189.325	C.681	C.555	38.597	-1.255	*	264.526	8.858	6.322	
	1160.C	23.57	*	16.934	5.929	107.192	*	-13.346	7.592	199.185	C.684	C.550	38.594	-5.197	*	248.029	9.344	6.638	
	1170.C	24.26	*	16.943	6.015	107.841	*	-14.136	7.551	209.049	C.690	C.565	38.586	-9.139	*	233.642	10.338	7.312	
	1180.C	25.26	*	16.958	6.156	108.707	*	-15.292	7.486	218.905	C.695	C.537	38.573	-13.104	*	221.724	11.717	8.303	
	1190.C	26.54	*	16.978	6.343	109.761	*	-16.846	7.400	228.765	C.711	C.655	38.556	-17.118	*	211.953	13.375	9.565	
1071 125	1120.C	27.67	*	16.958	6.514	109.920	*	-17.767	7.274	137.178	C.724	2.242	38.532	20.724	*	-24.692	15.007	10.870	
	1130.C	26.32	*	16.974	6.306	109.480	*	-16.484	7.411	147.038	0.709	2.154	38.555	16.482	*	-33.367	13.098	9.350	
	1140.C	25.04	*	16.957	6.146	109.107	*	-15.521	7.518	156.898	C.697	2.061	38.575	12.324	*	-43.885	11.425	8.088	
	1150.C	24.08	*	16.945	6.034	108.847	*	-14.868	7.596	166.758	C.685	1.965	38.594	8.239	*	-56.720	10.079	7.133	
	1160.C	23.47	*	16.938	5.965	108.750	*	-14.535	7.644	176.618	C.684	1.865	38.604	4.214	*	-71.995	9.179	6.530	
	1170.C	23.25	*	16.936	5.950	108.840	*	-14.517	7.665	186.478	C.682	1.762	38.608	0.232	*	-88.986	8.839	6.310	
	1180.C	23.42	*	16.935	5.977	109.135	*	-14.821	7.660	196.338	C.683	C.555	38.607	-3.725	*	254.015	9.108	6.483	
	1190.C	23.58	*	16.947	6.052	109.662	*	-15.479	7.630	206.198	C.688	C.578	38.601	-7.674	*	238.723	9.928	7.030	
	1200.C	24.87	*	16.960	6.174	110.387	*	-16.491	7.576	216.058	C.696	C.550	38.591	-11.641	*	225.869	11.183	7.912	
	1210.C	26.06	*	16.979	6.345	111.293	*	-17.887	7.502	225.918	C.707	C.512	38.576	-15.651	*	215.325	12.756	9.086	
1056 100	1150.C	26.68	*	16.951	6.455	111.541	*	-18.586	7.436	144.186	C.715	2.202	38.563	18.038	*	-30.013	13.790	9.892	
	1160.C	25.50	*	16.971	6.276	111.192	*	-17.488	7.549	154.046	0.702	2.110	38.585	13.859	*	-39.769	12.024	8.531	
	1170.C	24.41	*	16.957	6.145	110.929	*	-16.708	7.635	163.906	C.693	2.015	38.602	9.754	*	-51.678	10.546	7.458	
	1180.C	23.67	*	16.948	6.061	110.788	*	-16.241	7.692	173.766	C.686	1.915	38.613	5.709	*	-66.059	9.466	6.719	
	1190.C	23.30	*	16.944	6.025	110.813	*	-16.096	7.722	183.626	C.683	1.811	38.615	1.712	*	-82.557	8.907	6.354	
	1200.C	23.32	*	16.945	6.036	111.022	*	-16.274	7.727	193.486	C.684	C.558	38.620	-2.256	*	260.219	8.950	6.382	
	1210.C	23.15	*	16.951	6.094	111.428	*	-16.790	7.707	203.346	C.687	C.566	38.616	-6.215	*	244.126	9.580	6.794	
	1220.C	24.52	*	16.963	6.200	112.026	*	-17.660	7.665	213.206	C.694	C.562	38.608	-10.186	*	230.320	10.693	7.561	
	1230.C	25.62	*	16.980	6.356	112.799	*	-18.906	7.602	223.066	C.704	C.527	38.556	-14.193	*	218.942	12.167	8.638	
	1240.C	26.95	*	17.003	6.564	113.715	*	-20.553	7.520	232.926	C.717	C.682	38.580	-18.265	*	209.589	13.905	9.983	
ECATE	TTIME	CV	SLM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	CV1

ECATE	TTIME	DV	SUM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	DV1
1121 75	1170.C	27.47	*		17.009	6.614	113.445	*	-20.644	7.463	141.335	C.722	2.251	38.565	19.586	*	-26.926	14.501	10.460
	1180.C	26.00	*		16.986	6.416	113.137	*	-19.418	7.583	151.195	C.708	2.155	38.592	15.387	*	-35.996	12.656	9.010
	1190.C	24.80	*		16.970	6.267	112.880	*	-18.509	7.675	161.055	C.697	2.064	38.610	11.262	*	-47.038	11.064	7.826
	1200.C	23.52	*		16.959	6.165	112.712	*	-17.909	7.740	170.915	C.685	1.964	38.623	7.198	*	-60.486	9.823	6.958
	1210.C	23.40	*		16.953	6.111	112.692	*	-17.641	7.779	180.775	C.685	1.861	38.631	3.186	*	-76.292	9.059	6.452
	1220.C	23.29	*		16.952	6.105	112.826	*	-17.691	7.792	190.635	C.684	1.000	38.634	-0.795	*	266.537	8.876	6.334
	1230.C	23.57	*		16.957	6.146	113.133	*	-18.073	7.784	200.495	C.687	C.592	38.632	-4.763	*	249.823	9.299	6.608
	1240.C	24.22	*		16.967	6.236	113.619	*	-18.804	7.752	210.355	C.692	C.572	38.625	-8.737	*	235.089	10.252	7.252
	1250.C	25.21	*		16.982	6.376	114.271	*	-19.902	7.699	220.215	C.701	C.541	38.615	-12.743	*	222.823	11.613	8.226
	1260.C	26.45	*		17.004	6.566	115.063	*	-21.392	7.628	230.075	C.712	C.655	38.601	-16.806	*	212.762	13.272	9.485
1146 50	1150.C	28.08	*		17.025	6.781	115.199	*	-22.659	7.494	138.483	C.725	2.255	38.575	21.128	*	-24.072	15.228	11.051
	1200.C	26.52	*		17.003	6.566	114.943	*	-21.310	7.619	148.343	0.714	2.208	38.599	16.909	*	-32.529	13.316	9.519
	1210.C	25.22	*		16.984	6.358	114.707	*	-20.275	7.717	158.203	C.702	2.113	38.615	12.764	*	-42.775	11.624	8.234
	1220.C	24.22	*		16.971	6.278	114.540	*	-19.557	7.790	168.063	C.692	2.014	38.633	8.684	*	-55.288	10.243	7.246
	1230.C	23.57	*		16.963	6.206	114.472	*	-19.152	7.837	177.923	C.687	1.911	38.643	4.653	*	-70.278	9.290	6.602
	1240.C	23.30	*		16.961	6.183	114.550	*	-19.078	7.859	187.783	C.685	1.804	38.647	0.660	*	-87.128	8.886	6.340
	1250.C	23.44	*		16.963	6.207	114.768	*	-19.324	7.858	197.643	C.687	C.596	38.647	-3.317	*	255.759	9.091	6.473
	1260.C	23.96	*		16.971	6.280	115.162	*	-19.924	7.836	207.503	C.691	C.580	38.642	-7.295	*	240.175	9.866	6.987
	1270.C	24.64	*		16.985	6.404	115.706	*	-20.879	7.793	217.363	C.695	C.555	38.634	-11.300	*	226.989	11.098	7.850
	1280.C	26.02	*		17.005	6.579	116.384	*	-22.216	7.732	227.223	C.710	C.615	38.621	-15.356	*	216.154	12.666	9.017
1171 25	1210.C	28.71	*		17.050	6.957	116.814	*	-24.636	7.528	135.632	C.736	2.347	38.581	22.662	*	-21.422	15.969	11.662
	1220.C	27.08	*		17.022	6.724	116.611	*	-23.162	7.657	145.492	0.720	2.257	38.607	18.424	*	-29.337	13.997	10.056
	1230.C	25.68	*		17.000	6.535	116.413	*	-22.010	7.761	155.352	C.707	2.162	38.627	14.261	*	-38.858	12.220	8.678
	1240.C	24.56	*		16.985	6.401	116.249	*	-21.168	7.840	165.212	C.697	2.063	38.643	10.163	*	-50.484	10.716	7.577
	1250.C	23.78	*		16.975	6.311	116.167	*	-20.644	7.894	175.072	C.690	1.960	38.654	6.117	*	-64.571	9.593	6.804
	1260.C	23.37	*		16.970	6.270	116.191	*	-20.438	7.924	184.932	0.687	1.854	38.660	2.110	*	-80.878	8.978	6.399
	1270.C	23.36	*		16.971	6.277	116.353	*	-20.564	7.932	194.792	0.687	C.595	38.662	-1.876	*	261.882	8.961	6.389
	1280.C	23.75	*		16.977	6.333	116.652	*	-21.023	7.919	204.652	C.690	C.587	38.655	-5.860	*	245.564	9.542	6.769
	1290.C	24.50	*		16.989	6.435	117.098	*	-21.838	7.885	214.512	0.697	C.564	38.652	-9.865	*	231.452	10.626	7.514
	1300.C	25.59	*		17.007	6.597	117.676	*	-23.028	7.833	224.372	C.707	C.530	38.642	-13.914	*	219.787	12.092	8.582
1156 C	1240.C	27.66	*		17.042	6.885	118.153	*	-24.980	7.697	142.640	C.727	2.305	38.615	19.933	*	-26.386	14.696	10.617
	1250.C	26.17	*		17.017	6.687	117.993	*	-23.708	7.806	152.500	C.712	2.211	38.636	15.752	*	-35.259	12.845	9.154
	1260.C	24.95	*		17.000	6.532	117.852	*	-22.751	7.891	162.360	C.701	2.113	38.654	11.637	*	-46.053	11.235	7.949
	1270.C	24.04	*		16.987	6.424	117.761	*	-22.106	7.951	172.220	C.694	2.010	38.666	7.576	*	-59.221	9.961	7.052
	1280.C	23.49	*		16.981	6.365	117.757	*	-21.780	7.989	182.080	C.686	1.903	38.674	3.555	*	-74.803	9.149	6.510
	1290.C	23.34	*		16.980	6.355	117.861	*	-21.776	8.005	191.940	C.686	1.000	38.677	-0.441	*	268.086	8.911	6.356
	1300.C	23.58	*		16.984	6.393	118.094	*	-22.109	8.000	201.800	C.690	C.593	38.676	-4.430	*	251.229	9.284	6.599
	1310.C	24.21	*		16.994	6.482	118.454	*	-22.786	7.975	211.660	C.696	C.574	38.671	-8.435	*	236.226	10.204	7.219
	1320.C	25.15	*		17.010	6.623	118.932	*	-23.826	7.931	221.520	C.704	C.543	38.662	-12.480	*	223.679	11.552	8.181
	1330.C	26.41	*		17.033	6.817	119.521	*	-25.259	7.872	231.380	C.716	C.502	38.650	-16.589	*	213.382	13.215	9.440
1221 272	1260.C	28.26	*		17.063	7.062	119.574	*	-26.766	7.739	139.788	C.732	2.352	38.623	21.438	*	-23.646	15.410	11.200
	1270.C	26.70	*		17.036	6.842	119.460	*	-25.377	7.852	149.648	0.718	2.260	38.646	17.238	*	-31.941	13.495	9.660
	1280.C	25.37	*		17.015	6.670	119.346	*	-24.305	7.942	159.508	C.706	2.162	38.664	13.106	*	-41.974	11.793	8.359
	1290.C	24.35	*		17.001	6.545	119.261	*	-23.544	8.009	169.368	C.697	2.060	38.678	9.029	*	-54.239	10.387	7.346
	1300.C	23.66	*		16.992	6.468	119.237	*	-23.097	8.053	179.228	C.692	1.952	38.687	4.996	*	-68.987	9.395	6.671
	1310.C	23.36	*		16.989	6.440	119.304	*	-22.973	8.076	189.088	C.689	1.842	38.692	0.990	*	-85.713	8.941	6.376
	1320.C	23.47	*		16.992	6.461	119.475	*	-23.176	8.078	198.948	C.690	C.597	38.692	-3.007	*	257.111	9.098	6.477
	1330.C	23.97	*		17.000	6.533	119.764	*	-23.722	8.062	208.808	C.695	C.582	38.685	-7.013	*	241.304	9.837	6.968
	1340.C	24.83	*		17.014	6.656	120.164	*	-24.624	8.027	218.668	C.702	C.555	38.682	-11.053	*	227.855	11.051	7.817
	1350.C	26.02	*		17.035	6.832	120.661	*	-25.904	7.976	228.528	C.712	C.618	38.671	-15.151	*	216.783	12.620	8.982
ECATE	TTIME	DV	SUM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	DV1



TABLE XI. - Concluded. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 JUPITER RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	CV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
* *																
* *																
124E	12E.C	28.85	*	17.085	7.24C	120.882	* -28.521	7.783	136.937	C.741	2.40C	3E.632	22.936	* -21.093	16.136	11.801
34E	125C.C	27.25	*	17.055	7.004	120.817	* -27.017	7.899	146.797	C.725	2.20C	3E.655	18.179	* -28.873	14.166	10.191
	130C.C	25.82	*	17.033	6.814	120.737	* -25.832	7.993	156.657	C.712	2.211	3E.675	14.570	* -38.218	12.383	8.801
	131C.C	24.7C	*	17.016	6.673	120.669	* -24.96C	8.066	166.517	C.701	2.105	3E.69C	10.478	* -49.623	10.862	7.681
	132C.C	23.85	*	17.005	6.578	120.637	* -24.396	8.116	176.377	C.695	2.002	3E.70C	6.431	* -63.479	9.708	6.880
	133C.C	23.45	*	17.00C	6.533	120.675	* -24.151	8.146	186.237	C.691	1.893	3E.706	2.415	* -79.618	9.050	6.466
	1340.C	23.41	*	17.00C	6.536	120.797	* -24.227	8.155	196.097	C.691	C.595	3E.708	-1.589	* 263.142	8.988	6.406
	135C.C	23.77	*	17.006	6.55C	121.027	* -24.646	8.146	205.957	C.694	C.5E8	3E.706	-5.596	* 246.669	9.531	6.762
	136C.C	24.51	*	17.015	6.656	121.355	* -25.412	8.119	215.817	C.701	C.5E6	3E.701	-9.633	* 232.321	10.595	7.492
	137C.C	25.55	*	17.037	6.854	121.774	* -26.547	8.07E	225.677	C.71C	C.522	3E.692	-13.722	* 220.423	12.056	8.555
* *																
1271	131C.C	27.82	*	17.076	7.171	122.073	* -28.634	7.947	142.945	C.731	2.356	3E.665	2C.195	* -26.026	14.854	10.745
222	132C.C	26.32	*	17.051	6.966	122.030	* -27.337	8.045	153.805	C.717	2.259	3E.685	16.029	* -34.752	13.001	9.275
	133C.C	25.05	*	17.032	6.8C7	121.982	* -26.352	8.122	163.665	C.706	2.15E	3E.701	11.923	* -45.360	11.379	8.054
	134C.C	24.15	*	17.018	6.695	121.958	* -25.678	8.179	173.525	C.696	2.052	3E.713	7.863	* -58.312	10.082	7.135
	135C.C	23.5E	*	17.011	6.632	121.977	* -25.315	8.214	183.385	C.692	1.942	3E.721	3.836	* -73.711	9.235	6.566
	136C.C	23.39	*	17.010	6.615	122.069	* -25.274	8.231	193.245	C.692	1.00C	3E.724	-0.174	* 269.247	8.955	6.385
	1370.C	23.62	*	17.014	6.655	122.242	* -25.560	8.228	203.105	C.694	C.592	3E.724	-4.186	* 252.287	9.291	6.603
	138C.C	24.22	*	17.024	6.742	122.510	* -26.196	8.209	212.965	C.695	C.575	3E.72C	-8.220	* 237.084	10.187	7.207
	139C.C	25.2C	*	17.041	6.883	122.855	* -27.186	8.172	222.825	C.70E	C.545	3E.712	-12.301	* 224.317	11.527	8.163
	140C.C	26.45	*	17.065	7.07E	123.277	* -28.564	8.123	232.685	C.72C	C.504	3E.702	-16.454	* 213.828	13.196	9.426
* *																
125E	133C.C	28.42	*	17.058	7.344	123.226	* -30.221	7.995	141.094	C.73E	2.404	3E.675	21.666	* -23.378	15.556	11.320
25E	1340.C	26.85	*	17.070	7.122	123.226	* -28.815	8.096	150.954	C.722	2.20E	3E.696	17.484	* -31.550	13.642	9.775
	135C.C	25.51	*	17.046	6.947	123.210	* -27.725	8.178	160.814	C.711	2.207	3E.712	13.363	* -41.425	11.933	8.463
	1360.C	24.46	*	17.033	6.819	123.196	* -26.941	8.240	170.674	C.702	2.102	3E.726	9.290	* -53.500	10.510	7.432
	137C.C	23.76	*	17.024	6.738	123.211	* -26.466	8.282	180.534	C.696	1.992	3E.735	5.252	* -68.060	9.490	6.734
	138C.C	23.42	*	17.020	6.707	123.278	* -26.306	8.304	190.394	C.694	1.875	3E.740	1.234	* -84.679	9.000	6.413
	139C.C	23.51	*	17.022	6.726	123.413	* -26.473	8.309	200.254	C.694	C.597	3E.741	-2.780	* 258.110	9.121	6.492
	140C.C	24.0C	*	17.030	6.795	123.624	* -26.975	8.296	210.114	C.69E	C.5E2	3E.738	-6.813	* 242.140	9.834	6.966
	141C.C	24.65	*	17.045	6.918	123.914	* -27.834	8.267	219.974	C.70C	C.597	3E.732	-10.886	* 228.490	11.037	7.807
	1420.C	26.04	*	17.067	7.095	124.267	* -29.062	8.224	229.834	C.717	C.519	3E.723	-15.026	* 217.231	12.609	8.973
* *																
1221	135C.C	29.02	*	17.121	7.522	124.292	* -31.790	8.044	138.242	C.745	2.451	3E.685	23.135	* -20.901	16.270	11.913
273	136C.C	27.35	*	17.090	7.284	124.339	* -30.280	8.149	148.102	C.729	2.356	3E.707	18.936	* -28.578	14.304	10.301
	137C.C	25.97	*	17.066	7.092	124.354	* -29.081	8.234	157.962	C.716	2.256	3E.725	14.795	* -37.792	12.517	8.903
	1380.C	24.82	*	17.045	6.948	124.357	* -28.188	8.301	167.822	C.706	2.152	3E.735	10.713	* -49.035	10.984	7.768
	139C.C	23.55	*	17.037	6.851	124.377	* -27.605	8.348	177.682	C.699	2.042	3E.745	6.665	* -62.712	9.809	6.949
	140C.C	23.52	*	17.031	6.8C2	124.428	* -27.330	8.376	187.542	C.696	1.925	3E.756	2.639	* -78.718	9.121	6.492
	1410.C	23.46	*	17.031	6.8C3	124.533	* -27.377	8.387	197.402	C.695	C.599	3E.758	-1.380	* 264.063	9.025	6.430
	1420.C	23.81	*	17.037	6.855	124.696	* -27.750	8.380	207.262	C.69E	C.5E5	3E.756	-5.413	* 247.468	9.542	6.769
	143C.C	24.54	*	17.050	6.955	124.937	* -28.479	8.358	217.122	C.704	C.5E7	3E.752	-9.479	* 232.945	10.591	7.489
	1440.C	25.62	*	17.07C	7.118	125.234	* -29.569	8.321	226.982	C.714	C.522	3E.744	-13.606	* 22C.869	12.053	8.553
* *																
124E	13E.C	27.96	*	17.112	7.451	125.366	* -31.724	8.201	145.250	C.73E	2.404	3E.718	2C.384	* -25.814	14.981	10.848
24E	139C.C	26.46	*	17.085	7.243	125.417	* -30.421	8.290	155.110	C.722	2.205	3E.737	16.232	* -34.432	13.128	9.373
	140C.C	25.21	*	17.065	7.082	125.439	* -29.418	8.360	164.97C	C.711	2.201	3E.752	12.131	* -44.906	11.498	8.141
	1410.C	24.26	*	17.051	6.56E	125.472	* -28.731	8.412	174.83C	C.702	2.092	3E.763	8.072	* -57.696	10.186	7.206
	142C.C	23.66	*	17.043	6.5C3	125.521	* -28.348	8.446	184.690	C.69E	1.975	3E.771	4.035	* -72.949	9.314	6.618
	143C.C	23.46	*	17.041	6.886	125.603	* -28.277	8.462	194.55C	C.696	1.861	3E.774	0.015	* -89.940	9.004	6.416
	144C.C	23.66	*	17.045	6.921	125.738	* -28.534	8.462	204.410	C.69E	C.594	3E.774	-4.017	* 253.044	9.314	6.618
	145C.C	24.27	*	17.056	7.006	125.926	* -29.126	8.446	214.270	C.702	C.576	3E.771	-8.080	* 237.688	10.194	7.212
	146C.C	25.24	*	17.073	7.147	126.174	* -30.081	8.416	224.13C	C.712	1.946	3E.764	-12.195	* 224.758	11.531	8.166
	1470.C	26.53	*	17.09E	7.343	126.462	* -31.410	8.373	233.990	C.724	C.505	3E.755	-16.391	* 214.120	13.210	9.437
* *																
ECATE	TTIME	CV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

ECCE	TIME	CV	SUM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	CV1
1271	1400.0	28.55	*		17.134	7.621	126.311	*	-33.149	8.253	142.399	0.743	2.452	38.729	21.828	*	-23.235	15.671	11.415
223	1410.0	26.97	*		17.105	7.398	126.400	*	-31.743	8.345	152.259	0.728	2.354	38.749	17.660	*	-31.319	13.760	9.868
	1420.0	25.63	*		17.082	7.221	126.455	*	-30.641	8.419	162.119	0.716	2.250	38.765	13.546	*	-41.083	12.046	8.548
	1430.0	24.57	*		17.066	7.091	126.503	*	-29.848	8.476	171.979	0.707	2.142	38.777	9.477	*	-53.017	10.613	7.505
	1440.0	23.85	*		17.056	7.009	126.552	*	-29.356	8.515	181.839	0.701	2.029	38.786	5.435	*	-67.436	9.574	6.791
	1450.0	23.50	*		17.052	6.975	126.624	*	-29.174	8.536	191.699	0.696	1.912	38.790	1.406	*	-83.968	9.059	6.452
	1460.0	23.57	*		17.054	6.992	126.733	*	-29.312	8.542	201.559	0.695	0.997	38.792	-2.627	*	258.802	9.155	6.514
	1470.0	24.04	*		17.062	7.060	126.888	*	-29.783	8.532	211.415	0.702	0.984	38.789	-6.685	*	242.720	9.851	6.977
	1480.0	24.89	*		17.077	7.182	127.087	*	-30.601	8.507	221.279	0.710	0.958	38.784	-10.791	*	228.515	11.049	7.815
	1490.0	26.05	*		17.100	7.355	127.328	*	-31.789	8.471	231.139	0.721	0.920	38.776	-14.970	*	217.516	12.628	8.988

TABLE XII. - TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 SATURN RADII CIRCULAR PARKING ORBIT

EDATE	TTIME	CV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1	
186	250.C	86.84	*	45.710	60.846	2.509	*	83.454	61.187	66.500	4.588	1.609	72.010	24.311	* -50.733	47.489	41.131
	260.C	81.98	*	44.383	55.323	2.313	*	83.031	59.716	76.360	4.643	1.533	71.782	15.679	* -63.752	43.864	37.602
	270.C	78.31	*	43.183	57.935	2.269	*	82.769	58.358	86.220	4.556	1.445	70.656	7.407	* -77.263	41.313	35.127
	280.C	75.76	*	42.069	56.646	2.371	*	82.655	57.065	96.080	4.465	1.000	69.593	-0.482	* 269.158	39.825	33.687
	290.C	74.18	*	41.005	55.404	2.608	*	82.671	55.802	105.940	4.265	0.988	68.561	-7.960	* 256.018	39.294	33.175
	300.C	73.38	*	39.965	54.182	2.962	*	82.796	54.540	115.800	4.014	0.958	67.537	-14.997	* 243.768	39.539	33.411
	310.C	73.11	*	38.928	52.956	3.415	*	83.007	53.258	125.660	3.730	0.912	66.507	-21.564	* 232.696	40.333	34.179
	320.C	73.14	*	37.881	51.710	3.947	*	83.279	51.944	135.520	3.425	0.857	65.459	-27.632	* 222.912	41.451	35.261
	330.C	73.31	*	36.824	50.443	4.536	*	83.589	50.601	145.380	3.128	0.754	64.398	-33.186	* 214.389	42.714	36.485
	340.C	73.46	*	35.745	49.144	5.164	*	83.917	49.222	155.240	2.837	0.728	63.321	-38.213	* 207.028	43.972	37.706
227	250.C	72.38	*	38.159	52.042	3.676	*	83.081	52.315	68.820	3.565	1.615	65.754	23.894	* -48.731	40.378	34.222
	300.C	68.39	*	37.277	50.987	3.462	*	82.655	51.315	78.680	3.632	1.542	64.961	15.578	* -61.996	37.155	31.114
	310.C	65.46	*	36.471	50.018	3.400	*	82.388	50.374	88.540	3.624	1.460	64.220	7.624	* -75.884	34.937	28.988
	320.C	63.55	*	35.713	49.100	3.481	*	82.264	49.460	98.400	3.551	1.372	63.506	0.055	* -89.897	33.736	27.841
	330.C	62.55	*	34.976	48.203	3.695	*	82.266	48.545	108.260	3.425	0.950	62.756	-7.107	* 256.573	33.458	27.576
	340.C	62.26	*	34.241	47.302	4.025	*	82.373	47.607	118.120	3.255	0.962	62.072	-13.835	* 244.051	33.922	28.019
	350.C	62.45	*	33.492	46.375	4.454	*	82.561	46.631	127.980	3.066	0.921	61.328	-20.107	* 232.844	34.907	28.959
	360.C	62.52	*	32.723	45.424	4.961	*	82.808	45.613	137.840	2.856	0.868	60.558	-25.907	* 223.034	36.197	30.195
	370.C	63.48	*	31.929	44.432	5.530	*	83.093	44.548	147.700	2.642	0.805	59.760	-31.223	* 214.555	37.613	31.555
	380.C	64.04	*	31.119	43.410	6.141	*	83.398	43.449	157.560	2.432	0.746	58.945	-36.063	* 207.260	39.035	32.925
252	310.C	67.81	*	34.863	46.064	4.620	*	83.135	48.254	64.726	3.042	1.666	62.571	28.447	* -40.266	39.061	32.950
	320.C	63.65	*	34.129	47.165	4.308	*	82.615	47.425	74.586	3.144	1.555	61.934	20.131	* -53.090	35.494	29.521
	330.C	60.46	*	33.468	46.350	4.148	*	82.256	46.654	84.446	3.180	1.516	61.345	12.164	* -66.827	32.848	26.996
	340.C	58.28	*	32.851	45.584	4.136	*	82.047	45.907	94.306	3.155	1.431	60.775	4.567	* -81.076	31.194	25.426
	350.C	57.03	*	32.255	44.840	4.263	*	81.973	45.158	104.166	3.088	0.955	60.216	-2.639	* 264.786	30.508	24.778
	360.C	56.58	*	31.661	44.054	4.515	*	82.013	44.387	114.026	2.977	0.982	59.640	-9.431	* 251.416	30.663	24.924
	370.C	56.73	*	31.055	43.326	4.876	*	82.145	43.580	123.886	2.836	0.950	59.042	-15.789	* 239.289	31.456	25.674
	380.C	57.25	*	30.425	42.531	5.327	*	82.347	42.728	133.746	2.674	0.905	58.416	-21.698	* 228.612	32.665	26.821
	390.C	57.96	*	29.777	41.696	5.851	*	82.599	41.827	143.606	2.502	0.851	57.760	-27.147	* 219.373	34.092	28.181
	400.C	58.72	*	29.103	40.825	6.430	*	82.881	40.884	153.466	2.328	0.792	57.080	-32.141	* 211.435	35.591	29.614
277	340.C	60.07	*	31.425	43.801	5.218	*	82.613	43.985	70.493	2.735	1.645	59.341	24.615	* -44.364	34.577	28.644
	350.C	56.61	*	30.876	43.102	4.959	*	82.159	43.346	80.352	2.803	1.570	58.869	16.639	* -57.670	31.520	25.735
	360.C	54.05	*	30.369	42.455	4.851	*	81.863	42.733	90.213	2.820	1.485	58.415	9.015	* -71.851	29.390	23.724
	370.C	52.52	*	29.884	41.833	4.888	*	81.708	42.121	100.073	2.751	1.402	57.973	1.767	* -86.370	28.232	22.639
	380.C	51.81	*	29.403	41.213	5.057	*	81.677	41.490	109.933	2.722	0.955	57.516	-5.086	* 259.503	27.988	22.410
	390.C	51.80	*	28.912	40.577	5.345	*	81.748	40.823	119.793	2.624	0.972	57.037	-11.525	* 246.426	28.495	22.885
	400.C	52.26	*	28.355	39.907	5.736	*	81.901	40.108	129.653	2.502	0.926	56.527	-17.534	* 234.788	29.535	23.861
	410.C	53.02	*	27.866	39.205	6.208	*	82.114	39.351	139.513	2.367	0.885	55.992	-23.111	* 224.675	30.906	25.154
	420.C	53.50	*	27.309	38.465	6.748	*	82.368	38.544	149.373	2.224	0.834	55.428	-28.248	* 215.996	32.425	26.593
	430.C	54.75	*	26.726	37.685	7.340	*	82.647	37.690	159.233	2.080	0.776	54.838	-32.957	* 208.568	33.968	28.062
302	360.C	57.45	*	29.100	40.822	6.194	*	82.651	40.919	66.400	2.352	1.652	57.106	29.036	* -36.028	34.272	28.353
	370.C	53.72	*	28.625	40.208	5.837	*	82.101	40.382	76.260	2.461	1.622	56.722	21.048	* -48.674	30.851	25.102
	380.C	50.86	*	28.206	39.657	5.630	*	81.713	39.882	86.120	2.525	1.545	56.367	13.398	* -62.475	28.262	22.667
	390.C	48.93	*	27.810	39.132	5.573	*	81.474	39.382	95.980	2.528	1.462	56.015	6.109	* -77.051	26.603	21.120
	400.C	47.88	*	27.418	38.614	5.655	*	81.367	38.866	105.840	2.455	1.000	55.652	-0.802	* 268.276	25.889	20.459
	410.C	47.60	*	27.018	38.080	5.866	*	81.373	38.314	115.700	2.430	0.985	55.269	-7.316	* 254.307	26.019	20.579
	420.C	47.92	*	26.605	37.527	6.187	*	81.472	37.725	125.560	2.342	0.961	54.863	-13.424	* 241.637	26.812	21.315
	430.C	48.63	*	26.170	36.935	6.604	*	81.642	37.088	135.420	2.237	0.922	54.426	-19.116	* 230.544	28.046	22.465
	440.C	49.56	*	25.708	36.310	7.098	*	81.863	36.399	145.280	2.122	0.873	53.955	-24.387	* 221.011	29.525	23.852
	450.C	50.56	*	25.220	35.642	7.656	*	82.118	35.661	155.140	2.002	0.816	53.464	-29.245	* 212.871	31.099	25.336
EDATE	TTIME	CV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	CV1	

ECATE	TIME	DV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMIC	VEL1	ALPHA1	PHI1	VINF1	DV1	
327 50	350.C	51.6E	*	26.681	37.62E	6.781	*	82.083	37.725	72.167	2.2C7	1.672	54.862	25.384	* -40.088	30.740	24.997
	400.C	48.50	*	26.321	37.143	6.475	*	81.599	37.306	82.027	2.2E5	1.595	54.575	17.713	* -53.227	27.737	22.176
	410.C	46.17	*	25.589	36.653	6.321	*	81.272	36.897	91.887	2.2E5	1.515	54.296	10.387	* -67.503	25.583	20.177
	420.C	44.72	*	25.668	36.256	6.313	*	81.086	36.477	101.747	2.2E8	1.434	54.012	3.422	* -82.396	24.360	19.051
	430.C	44.11	*	25.345	35.814	6.440	*	81.023	36.029	111.607	2.252	C.598	52.710	-3.167	* 262.911	24.042	18.761
	440.C	44.15	*	25.010	35.351	6.688	*	81.062	35.542	121.467	2.152	C.581	52.385	-9.364	* 249.230	24.495	19.176
	450.C	44.77	*	24.654	34.857	7.042	*	81.183	35.008	131.327	2.114	C.545	53.031	-15.163	* 237.067	25.514	20.113
	460.C	45.66	*	24.273	34.326	7.485	*	81.366	34.423	141.187	2.023	C.507	52.646	-20.559	* 226.560	26.888	21.385
	470.C	46.70	*	23.868	33.754	8.002	*	81.593	33.789	151.047	1.924	C.457	52.234	-25.558	* 217.598	28.442	22.835
	480.C	47.7E	*	23.439	33.145	8.580	*	81.849	33.10E	160.907	1.822	C.401	51.796	-30.171	* 209.966	30.049	24.345
352 25	410.C	50.25	*	24.980	35.310	7.794	*	82.107	35.31E	68.073	1.572	1.721	52.236	29.647	* -32.065	31.074	25.313
	420.C	46.84	*	24.668	34.878	7.389	*	81.525	34.970	77.933	2.047	1.651	52.005	21.958	* -44.371	27.728	22.167
	430.C	44.14	*	24.388	34.4E6	7.136	*	81.106	34.636	87.793	2.090	1.575	52.786	14.597	* -58.027	25.123	19.752
	440.C	42.25	*	24.123	34.114	7.033	*	80.835	34.296	97.653	2.103	1.453	52.563	7.582	* -72.749	23.386	18.162
	450.C	41.28	*	23.860	33.743	7.072	*	80.698	33.932	107.513	2.089	1.407	52.327	C.927	* -87.850	22.566	17.418
	460.C	41.04	*	23.5E7	33.356	7.241	*	80.673	33.533	117.373	2.052	C.594	52.069	-5.355	* 257.584	22.600	17.449
	470.C	41.40	*	23.297	32.942	7.526	*	80.740	33.089	127.232	1.956	C.571	51.784	-11.254	* 244.321	23.322	18.104
	480.C	42.18	*	22.985	32.454	7.911	*	80.880	32.596	137.093	1.926	C.526	51.471	-16.767	* 232.730	24.519	19.198
	490.C	43.21	*	22.649	32.007	8.382	*	81.074	32.054	146.953	1.847	C.482	51.129	-21.896	* 222.822	25.996	20.558
	500.C	44.34	*	22.250	31.482	8.923	*	81.306	31.463	156.813	1.763	C.441	50.760	-26.653	* 214.410	27.599	22.048
377 C	440.C	45.77	*	23.216	32.826	8.374	*	81.491	32.838	73.840	1.855	1.702	51.624	26.135	* -36.090	28.139	22.552
	450.C	42.75	*	22.976	32.481	8.019	*	80.976	32.566	83.700	1.905	1.625	51.452	18.742	* -48.903	25.150	19.777
	460.C	40.51	*	22.755	32.161	7.817	*	80.618	32.294	93.560	1.927	1.551	51.280	11.680	* -63.083	22.932	17.750
	470.C	39.0E	*	22.539	31.847	7.764	*	80.401	32.003	103.420	1.941	1.467	51.097	4.963	* -78.188	21.593	16.542
	480.C	38.46	*	22.317	31.522	7.850	*	80.307	31.679	113.280	1.922	1.000	50.854	-1.397	* 266.637	21.146	16.142
	490.C	38.53	*	22.080	31.174	8.061	*	80.315	31.312	123.140	1.885	C.587	50.667	-7.388	* 252.349	21.488	16.448
	500.C	39.12	*	21.824	30.795	8.383	*	80.407	30.898	132.000	1.833	C.561	50.412	-13.008	* 239.609	22.430	17.296
	510.C	40.0E	*	21.545	30.385	8.799	*	80.563	30.440	142.860	1.771	C.523	50.132	-18.263	* 228.627	23.769	18.512
	520.C	41.1E	*	21.245	29.935	9.298	*	80.766	29.930	152.720	1.702	C.476	49.825	-23.153	* 219.312	25.320	19.934
	530.C	42.3E	*	20.927	29.44E	9.864	*	81.002	29.374	162.580	1.630	C.424	49.493	-27.695	* 211.421	26.955	21.448
402 352	460.C	45.1E	*	21.540	30.967	9.430	*	81.501	30.888	69.747	1.650	1.751	50.406	30.240	* -28.489	28.883	23.249
	470.C	41.90	*	21.727	30.652	8.975	*	80.886	30.664	79.607	1.750	1.682	50.269	22.823	* -40.346	25.584	20.177
	480.C	39.30	*	21.538	30.365	8.673	*	80.434	30.445	89.467	1.78E	1.606	50.136	15.720	* -53.698	22.944	17.760
	490.C	37.46	*	21.358	30.099	8.524	*	80.133	30.214	99.327	1.805	1.526	49.996	8.946	* -68.381	21.102	16.103
	500.C	36.43	*	21.177	29.826	8.520	*	79.965	29.956	109.187	1.802	1.441	49.840	2.514	* -83.768	20.141	15.250
	510.C	36.14	*	20.985	29.536	8.651	*	79.910	29.659	119.047	1.781	C.997	49.662	-3.566	* 261.132	20.036	15.157
	520.C	36.48	*	20.778	29.220	8.903	*	79.948	29.318	128.907	1.745	C.975	49.455	-9.289	* 247.253	20.647	15.698
	530.C	37.26	*	20.553	28.875	9.259	*	80.062	28.933	138.767	1.657	C.945	49.232	-14.659	* 235.101	21.776	16.707
	540.C	38.32	*	20.304	28.491	9.708	*	80.232	28.496	148.627	1.642	C.90E	48.977	-19.675	* 224.752	23.220	18.011
	550.C	39.51	*	20.034	28.071	10.236	*	80.443	28.013	158.487	1.5E1	C.860	48.657	-24.351	* 216.012	24.823	19.476
427 327	450.C	41.50	*	20.625	28.986	10.003	*	80.837	28.914	75.513	1.611	1.723	49.221	26.835	* -32.490	26.343	20.879
	500.C	38.55	*	20.458	28.730	9.599	*	80.288	28.739	85.373	1.656	1.661	49.115	19.696	* -44.861	23.355	18.134
	510.C	36.37	*	20.306	28.494	9.351	*	79.898	28.558	95.233	1.682	1.5E3	49.013	12.871	* -58.776	21.062	16.067
	520.C	34.92	*	20.157	28.262	9.254	*	79.650	28.355	105.093	1.691	1.500	48.895	6.373	* -73.916	19.590	14.764
	530.C	34.24	*	20.002	28.015	9.299	*	79.527	28.120	114.953	1.683	1.415	48.755	0.211	* -89.457	18.989	14.238
	540.C	34.25	*	19.833	27.755	9.474	*	79.507	27.842	124.813	1.660	C.992	48.595	-5.607	* 255.676	19.193	14.417
	550.C	34.81	*	19.650	27.466	9.764	*	79.573	27.523	134.673	1.626	C.970	48.417	-11.085	* 242.318	20.037	15.158
	560.C	35.74	*	19.446	27.140	10.158	*	79.705	27.152	144.533	1.5E2	C.936	48.207	-16.219	* 230.816	21.311	16.290
	570.C	36.8E	*	19.220	26.775	10.640	*	79.886	26.734	154.393	1.533	C.893	47.973	-21.022	* 221.095	22.835	17.662
	580.C	38.13	*	18.575	26.3E3	11.200	*	80.105	26.271	164.253	1.480	C.844	47.717	-25.509	* 212.902	24.475	19.157
ECATE	TIME	DV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMIC	VEL1	ALPHA1	PHI1	VINF1	DV1	

TABLE XII. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 SATURN RADII CIRCULAR PARKING ORBIT

ECATE	TIME	CV	SUM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMIC	VEL1	ALPHA1	*	PHI1	VINF1	CV1
				*				*								*			
452	510.0	41.46	*		19.648	27.463	11.106	*	80.832	27.297	71.420	1.452	1.782	46.285	30.783	*	-25.364	27.350	21.815
302	520.0	38.31	*		19.459	27.226	10.599	*	80.182	27.159	81.280	1.540	1.712	46.211	23.611	*	-36.723	24.091	18.806
	530.0	35.15	*		19.368	27.016	10.249	*	79.698	27.020	91.140	1.572	1.638	46.132	16.740	*	-49.658	21.416	16.384
	540.0	33.50	*		19.243	26.815	10.054	*	79.366	26.865	101.000	1.585	1.556	46.046	10.180	*	-64.140	19.469	14.658
	550.0	32.81	*		19.116	26.611	10.008	*	79.168	26.682	110.860	1.591	1.474	47.944	3.944	*	-79.653	18.359	13.691
	560.0	32.45	*		18.980	26.391	10.101	*	79.085	26.461	120.720	1.560	0.995	47.821	-1.963	*	264.806	18.097	13.465
	570.0	32.71	*		18.830	26.146	10.320	*	79.097	26.196	130.580	1.557	0.986	47.675	-7.539	*	250.326	18.578	13.880
	580.0	33.45	*		18.662	25.871	10.652	*	79.186	25.885	140.440	1.524	0.955	47.505	-12.784	*	237.591	19.612	14.784
	590.0	34.45	*		18.475	25.563	11.083	*	79.334	25.527	150.300	1.485	0.922	47.311	-17.706	*	226.757	21.003	16.015
	600.0	35.71	*		18.270	25.221	11.601	*	79.526	25.124	160.160	1.441	0.877	47.055	-22.320	*	217.646	22.588	17.439
			*					*								*			
477	540.0	38.36	*		18.646	25.844	11.676	*	80.118	25.690	77.187	1.438	1.764	47.355	27.467	*	-29.336	25.078	19.711
277	550.0	35.52	*		18.529	25.651	11.221	*	79.535	25.587	87.047	1.474	1.692	47.343	20.553	*	-41.217	22.096	16.995
	560.0	33.32	*		18.423	25.476	10.925	*	79.114	25.472	96.907	1.457	1.615	47.281	13.938	*	-54.757	19.737	14.893
	570.0	31.82	*		18.318	25.302	10.784	*	78.836	25.334	106.767	1.507	1.522	47.207	7.632	*	-69.776	18.137	13.499
	580.0	31.06	*		18.208	25.117	10.789	*	78.684	25.163	116.627	1.504	1.448	47.115	1.643	*	-85.543	17.378	12.845
	590.0	30.58	*		18.087	24.913	10.930	*	78.638	24.951	126.487	1.491	0.996	47.002	-4.026	*	259.086	17.432	12.894
	600.0	31.46	*		17.950	24.683	11.193	*	78.679	24.694	136.347	1.468	0.978	46.867	-9.376	*	245.129	18.154	13.514
	610.0	32.35	*		17.756	24.422	11.566	*	78.788	24.391	146.207	1.437	0.947	46.708	-14.412	*	233.073	19.349	14.553
	620.0	33.49	*		17.625	24.128	12.036	*	78.951	24.043	156.067	1.402	0.908	46.527	-19.144	*	222.910	20.833	15.863
	630.0	34.76	*		17.436	23.801	12.590	*	79.153	23.652	165.927	1.363	0.861	46.326	-23.589	*	214.383	22.463	17.325
			*					*								*			
502	560.0	36.66	*		17.866	24.574	12.830	*	80.098	24.322	73.094	1.350	1.814	46.672	31.262	*	-22.687	26.252	20.795
252	570.0	35.62	*		17.779	24.391	12.271	*	79.412	24.247	82.954	1.387	1.745	46.633	24.313	*	-33.539	23.035	17.843
	580.0	33.11	*		17.686	24.232	11.870	*	78.895	24.167	92.814	1.414	1.670	46.591	17.647	*	-46.004	20.334	15.421
	590.0	31.23	*		17.598	24.082	11.629	*	78.533	24.068	102.674	1.425	1.591	46.540	11.278	*	-60.167	18.296	13.636
	600.0	30.07	*		17.508	23.927	11.541	*	78.307	23.940	112.534	1.424	1.507	46.474	5.212	*	-75.658	17.043	12.564
	610.0	29.62	*		17.411	23.757	11.597	*	78.197	23.775	122.394	1.428	1.000	46.385	-0.545	*	268.479	16.623	12.209
	620.0	29.80	*		17.300	23.565	11.786	*	78.185	23.568	132.254	1.412	0.991	46.283	-5.993	*	253.450	16.963	12.496
	630.0	30.47	*		17.175	23.345	12.095	*	78.251	23.315	142.114	1.391	0.968	46.155	-11.135	*	240.125	17.894	13.290
	640.0	31.47	*		17.033	23.094	12.510	*	78.379	23.018	151.974	1.363	0.934	46.006	-15.979	*	228.782	19.221	14.440
	650.0	32.65	*		16.874	22.811	13.020	*	78.555	22.676	161.834	1.330	0.892	45.836	-20.541	*	219.275	20.775	15.812
			*					*								*			
527	590.0	35.98	*		17.108	23.228	13.399	*	79.332	22.993	78.860	1.311	1.756	45.993	28.018	*	-26.628	24.169	18.877
227	600.0	33.21	*		17.024	23.075	12.893	*	78.714	22.941	88.720	1.340	1.724	45.967	21.308	*	-38.009	21.200	16.191
	610.0	31.01	*		16.945	22.945	12.548	*	78.261	22.876	98.580	1.355	1.647	45.935	14.881	*	-51.108	18.789	14.064
	620.0	29.47	*		16.875	22.813	12.362	*	77.955	22.786	108.440	1.365	1.565	45.890	8.745	*	-65.885	17.077	12.592
	630.0	28.62	*		16.756	22.672	12.328	*	77.776	22.663	118.300	1.365	1.481	45.825	2.906	*	-81.737	16.168	11.827
	640.0	28.45	*		16.707	22.512	12.436	*	77.706	22.500	128.160	1.361	0.998	45.749	-2.633	*	262.484	16.068	11.744
	650.0	28.85	*		16.605	22.328	12.674	*	77.723	22.294	138.020	1.345	0.984	45.648	-7.875	*	247.957	16.665	12.245
	660.0	29.67	*		16.488	22.115	13.028	*	77.812	22.043	147.880	1.324	0.957	45.526	-12.827	*	235.342	17.773	13.186
	670.0	30.78	*		16.356	21.872	13.487	*	77.957	21.748	157.740	1.298	0.920	45.384	-17.500	*	224.718	19.205	14.427
	680.0	32.06	*		16.208	21.600	14.041	*	78.145	21.411	167.600	1.265	0.875	45.223	-21.909	*	215.837	20.815	15.847
			*					*								*			
ECATE	TIME	CV	SUM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	CV1

ECATE	TTIME	CV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1
566	630.C	34.22	*	16.133	21.461	14.716 *	78.595	21.175	81.180	1.238	1.812	45.112	27.703 *	-25.871	23.308	18.091
188	640.C	31.55	*	16.069	21.340	14.186 *	77.969	21.153	91.040	1.261	1.741	45.102	21.165 *	-37.041	20.401	15.480
	650.C	29.41	*	16.011	21.231	13.820 *	77.508	21.116	100.900	1.276	1.662	45.084	14.898 *	-49.969	18.021	13.399
	660.C	27.90	*	15.953	21.123	13.617 *	77.194	21.052	110.760	1.284	1.562	45.054	8.911 *	-64.666	16.309	11.946
	670.C	27.06	*	15.851	21.005	13.569 *	77.008	20.955	120.620	1.285	1.457	45.009	3.206 *	-80.577	15.376	11.172
	680.C	26.88	*	15.819	20.870	13.666 *	76.929	20.818	130.480	1.279	1.555	44.945	-2.214 *	263.459	15.241	11.061
	690.C	27.26	*	15.737	20.711	13.897 *	76.938	20.639	140.340	1.267	1.585	44.863	-7.354 *	248.695	15.804	11.525
	700.C	28.07	*	15.640	20.526	14.251 *	77.019	20.417	150.200	1.250	1.560	44.761	-12.221 *	235.866	16.885	12.430
	710.C	25.17	*	15.530	20.313	14.714 *	77.156	20.151	160.060	1.230	1.524	44.640	-16.828 *	225.079	18.301	13.641
	720.C	30.45	*	15.406	20.071	15.278 *	77.338	19.845	169.920	1.207	1.480	44.503	-21.190 *	216.085	19.905	15.041
605	670.C	32.74	*	15.320	19.903	16.063 *	77.810	19.567	83.500	1.175	1.821	44.380	27.369 *	-25.295	22.566	17.419
150	680.C	30.15	*	15.269	19.803	15.509 *	77.175	19.570	93.360	1.156	1.757	44.381	20.989 *	-36.274	19.718	14.877
	690.C	28.07	*	15.224	19.713	15.122 *	76.707	19.555	103.220	1.208	1.675	44.374	14.870 *	-49.039	17.371	12.843
	700.C	26.59	*	15.179	19.624	14.902 *	76.387	19.512	113.080	1.215	1.557	44.356	9.018 *	-63.650	15.665	11.410
	710.C	25.76	*	15.129	19.525	14.841 *	76.193	19.435	122.940	1.216	1.512	44.322	3.436 *	-79.598	14.714	10.631
	720.C	25.57	*	15.072	19.405	14.929 *	76.107	19.319	132.800	1.211	1.555	44.271	-1.876 *	264.283	14.550	10.499
	730.C	25.93	*	15.003	19.272	15.157 *	76.109	19.162	142.660	1.202	1.587	44.203	-6.624 *	249.311	15.083	10.931
	740.C	26.73	*	14.923	19.110	15.511 *	76.183	18.962	152.520	1.185	1.562	44.116	-11.716 *	236.290	16.141	11.805
	750.C	27.82	*	14.830	18.921	15.982 *	76.314	18.721	162.380	1.172	1.527	44.013	-16.265 *	225.567	17.543	12.989
	760.C	29.10	*	14.726	18.705	16.560 *	76.490	18.440	172.240	1.154	1.485	43.894	-20.587 *	216.260	19.141	14.371
630	690.C	33.53	*	14.697	19.056	17.342 *	77.722	18.615	79.406	1.137	1.861	43.965	30.813 *	-19.537	23.898	18.629
125	700.C	30.74	*	14.647	18.955	16.678 *	76.979	18.637	89.266	1.152	1.810	43.977	24.388 *	-29.522	20.869	15.895
	710.C	28.41	*	14.607	18.872	16.180 *	76.416	18.648	99.126	1.166	1.734	43.982	18.211 *	-41.144	18.252	13.599
	720.C	26.61	*	14.565	18.795	15.854 *	76.010	18.633	108.986	1.174	1.654	43.976	12.292 *	-54.648	16.181	11.839
	730.C	25.42	*	14.529	18.712	15.694 *	75.743	18.587	118.846	1.178	1.570	43.956	6.635 *	-69.918	14.791	10.694
	740.C	24.88	*	14.483	18.617	15.693 *	75.595	18.505	128.706	1.177	1.464	43.922	1.239 *	-86.157	14.173	10.197
	750.C	24.54	*	14.428	18.503	15.840 *	75.545	18.382	138.566	1.171	1.556	43.870	-3.898 *	257.973	14.313	10.308
	760.C	25.45	*	14.563	18.367	16.124 *	75.576	18.219	148.426	1.161	1.578	43.802	-8.784 *	243.673	15.083	10.931
	770.C	26.42	*	14.486	18.206	16.534 *	75.672	18.014	158.286	1.145	1.550	43.717	-13.429 *	231.473	16.300	11.938
	780.C	27.60	*	14.398	18.020	17.060 *	75.821	17.768	168.146	1.134	1.512	43.617	-17.849 *	221.306	17.797	13.207
655	720.C	31.50	*	14.468	18.168	17.929 *	76.826	17.753	85.172	1.116	1.862	43.610	27.748 *	-23.493	22.139	17.033
100	730.C	28.95	*	14.425	18.085	17.322 *	76.158	17.781	95.033	1.128	1.788	43.622	21.522 *	-34.041	19.312	14.520
	740.C	26.87	*	14.356	18.015	16.885 *	75.662	17.793	104.893	1.128	1.710	43.627	15.540 *	-46.372	16.940	12.477
	750.C	25.36	*	14.363	17.944	16.622 *	75.316	17.775	114.753	1.142	1.627	43.615	9.812 *	-60.634	15.159	10.994
	760.C	24.46	*	14.326	17.866	16.525 *	75.099	17.724	124.613	1.144	1.542	43.598	4.338 *	-76.468	14.095	10.134
	770.C	24.18	*	14.282	17.772	16.585 *	74.993	17.634	134.473	1.141	1.000	43.562	-0.884 *	267.211	13.803	9.902
	780.C	24.47	*	14.230	17.655	16.792 *	74.976	17.504	144.333	1.135	1.590	43.510	-5.859 *	251.805	14.224	10.237
	790.C	25.19	*	14.167	17.523	17.134 *	75.033	17.333	154.193	1.125	1.566	43.441	-10.597 *	238.292	15.199	11.026
	800.C	26.24	*	14.054	17.363	17.602 *	75.150	17.122	164.053	1.112	1.535	43.357	-15.110 *	226.926	16.549	12.147
	810.C	27.50	*	14.010	17.175	18.187 *	75.315	16.872	173.913	1.100	1.485	43.255	-19.414 *	217.490	18.122	13.486
660	740.C	32.35	*	14.127	17.436	19.267 *	76.717	16.912	81.080	1.084	1.512	43.275	31.072 *	-18.089	23.496	18.262
75	750.C	29.66	*	14.088	17.351	18.547 *	75.939	16.958	90.940	1.095	1.841	43.293	24.799 *	-27.692	20.508	15.574
	760.C	27.35	*	14.056	17.281	18.001 *	75.343	16.988	100.800	1.105	1.764	43.305	18.763 *	-38.884	17.895	13.291
	770.C	25.53	*	14.027	17.218	17.630 *	74.911	16.995	110.660	1.111	1.684	43.307	12.971 *	-51.980	15.781	11.506
	780.C	24.30	*	13.957	17.151	17.431 *	74.620	16.971	120.520	1.112	1.555	43.258	7.424 *	-66.977	14.304	10.302
	790.C	23.68	*	13.963	17.077	17.395 *	74.453	16.914	130.380	1.112	1.512	43.276	2.119 *	-83.227	13.571	9.719
	800.C	23.66	*	13.921	16.983	17.518 *	74.384	16.816	140.240	1.105	1.557	43.238	-2.941 *	260.607	13.593	9.736
	810.C	24.14	*	13.871	16.870	17.787 *	74.398	16.678	150.100	1.102	1.582	43.184	-7.767 *	245.852	14.266	10.271
	820.C	25.02	*	13.810	16.734	18.191 *	74.479	16.499	159.960	1.092	1.556	43.115	-12.370 *	233.194	15.417	11.206
	830.C	26.16	*	13.740	16.575	18.720 *	74.615	16.281	169.820	1.082	1.520	43.032	-16.765 *	222.648	16.876	12.422
ECATE	TTIME	CV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1

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ECATE	TTIME	DV	SUM *		DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMIC	VEL1	ALPHA1 *	PHI1	VINF1	DV1
			*				*							*			
			*				*							*			
7C5	77C.C	30.51	*	13.779	16.665	19.860	*	75.760	16.170	86.847	1.067	1.892	42.990	28.046	*-22.012	21.803	16.731
5C	780.C	28.0C	*	13.748	16.595	19.199	*	75.060	16.220	96.707	1.075	1.818	43.005	21.959	*-32.177	19.001	14.249
	79C.C	25.92	*	13.722	16.536	18.716	*	74.535	16.250	106.567	1.082	1.739	42.020	16.105	*-44.094	16.616	12.203
	80C.C	24.3E	*	13.657	16.478	18.411	*	74.164	16.251	116.427	1.086	1.656	42.021	10.489	*-57.996	14.778	10.683
	810.C	23.42	*	13.669	16.414	18.279	*	73.926	16.220	126.287	1.087	1.571	43.009	5.112	*-73.655	13.618	9.756
	820.C	23.07	*	13.636	16.337	18.311	*	73.800	16.151	136.147	1.085	1.0CC	42.982	-0.029	*269.905	13.213	9.439
	830.C	23.28	*	13.595	16.243	18.499	*	73.766	16.044	146.007	1.08C	C.953	42.943	-4.939	*254.139	13.528	9.686
	84C.C	23.54	*	13.545	16.125	18.832	*	73.808	15.896	155.867	1.073	C.973	42.888	-9.629	*240.175	14.424	10.398
	850.C	24.94	*	13.4E7	15.592	19.299	*	73.911	15.709	165.727	1.065	C.942	42.819	-14.111	*228.397	15.723	11.457
	860.C	26.1E	*	13.415	15.834	19.893	*	74.064	15.484	175.587	1.055	C.902	42.737	-18.400	*218.633	17.270	12.756
			*				*							*			
73C	79C.C	31.47	*	13.5C1	16.026	21.261	*	75.626	15.418	82.753	1.042	1.542	42.712	31.263	*-16.914	23.169	17.965
25	80C.C	28.75	*	13.465	15.952	20.486	*	74.813	15.484	92.613	1.05	1.87C	42.737	25.129	*-26.180	20.223	15.322
	81C.C	26.5C	*	13.444	15.893	19.888	*	74.188	15.533	102.473	1.056	1.792	42.755	19.219	*-36.991	17.620	13.055
	82C.C	24.6E	*	13.422	15.841	19.471	*	73.731	15.558	112.333	1.06C	1.712	42.764	13.538	*-49.703	15.479	11.256
	83C.C	23.4C	*	13.395	15.787	19.234	*	73.419	15.553	122.193	1.062	1.628	42.762	8.090	*-64.411	13.933	10.005
	840.C	22.72	*	13.373	15.724	19.170	*	73.230	15.512	132.053	1.062	1.541	42.747	2.873	*-80.588	13.100	9.351
	850.C	22.62	*	13.340	15.647	19.270	*	73.143	15.433	141.913	1.055	C.959	42.719	-2.119	*263.030	13.015	9.286
	86C.C	23.04	*	13.3C0	15.551	19.525	*	73.141	15.315	151.773	1.054	C.98E	42.676	-6.892	*247.878	13.599	9.741
	87C.C	23.8E	*	13.252	15.435	19.924	*	73.208	15.158	161.633	1.048	C.961	42.62C	-11.458	*234.796	14.686	10.609
	88C.C	24.97	*	13.195	15.295	20.459	*	73.332	14.962	171.493	1.04C	C.927	42.551	-15.832	*223.889	16.107	11.777
			*				*							*			
755	82C.C	29.7C	*	13.217	15.351	21.862	*	74.606	14.777	88.520	1.029	1.					

ECATE	TTIME	DV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMIC	VEL1	ALPHA1 *	PHI1	VINF1	DV1
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ECATE	TTIME	DV	SLM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMIC	VEL1	ALPHA1	*	PHI1	VINF1	CV1
				*				*								*			
				*				*								*			
83C	850.C	30.06	*		12.567	13.706	25.470	*	73.161	12.928	86.100	0.985	2.000	41.879	31.462	*	-15.233	22.654	17.498
8C2	900.C	27.48	*		12.543	13.642	24.585	*	72.283	13.023	95.960	0.985	1.927	41.908	25.568	*	-23.951	19.791	14.941
	910.C	25.24	*		12.525	13.595	23.886	*	71.604	13.100	105.820	0.986	1.845	41.932	19.877	*	-34.132	17.224	12.717
	920.C	23.42	*		12.511	13.556	23.380	*	71.102	13.152	115.680	0.986	1.766	41.948	14.392	*	-46.172	15.056	10.910
	930.C	22.09	*		12.496	13.518	23.066	*	70.751	13.173	125.540	0.986	1.681	41.955	9.114	*	-60.310	13.417	9.598
	940.C	21.32	*		12.480	13.473	22.942	*	70.528	13.160	135.400	0.986	1.592	41.951	4.040	*	-76.248	12.433	8.839
	950.C	21.11	*		12.460	13.419	23.000	*	70.410	13.111	145.260	0.984	1.000	41.936	-0.835	*	267.125	12.176	8.645
	960.C	21.41	*		12.434	13.350	23.232	*	70.380	13.024	155.120	0.982	0.991	41.908	-5.519	*	251.354	12.606	8.971
	970.C	22.13	*		12.403	13.265	23.628	*	70.421	12.899	164.980	0.979	0.969	41.870	-10.023	*	237.549	13.581	9.727
	980.C	23.18	*		12.366	13.163	24.181	*	70.522	12.737	174.840	0.975	0.936	41.820	-14.363	*	226.001	14.934	10.810
			*					*								*			
855	920.C	26.46	*		12.371	13.177	26.092	*	72.007	12.443	51.867	0.972	1.976	41.732	28.532	*	-19.076	21.091	16.094
277	930.C	26.06	*		12.352	13.124	25.272	*	71.218	12.536	101.727	0.972	1.902	41.759	22.790	*	-28.353	18.381	13.710
	940.C	24.03	*		12.337	13.084	24.645	*	70.620	12.606	111.587	0.972	1.821	41.781	17.248	*	-39.277	16.004	11.691
	950.C	22.44	*		12.324	13.048	24.216	*	70.188	12.649	121.447	0.972	1.736	41.793	11.907	*	-52.217	14.075	10.118
	960.C	21.37	*		12.311	13.010	23.981	*	69.895	12.658	131.307	0.972	1.645	41.756	6.767	*	-67.233	12.727	9.063
	970.C	20.86	*		12.295	12.965	23.937	*	69.720	12.633	141.167	0.970	1.555	41.789	1.822	*	-83.679	12.071	8.566
	980.C	20.85	*		12.274	12.908	24.076	*	69.641	12.570	151.027	0.969	0.997	41.770	-2.933	*	259.855	12.135	8.614
	990.C	21.35	*		12.249	12.837	24.389	*	69.642	12.471	160.887	0.966	0.983	41.740	-7.510	*	244.836	12.829	9.142
	1000.C	22.27	*		12.218	12.750	24.867	*	69.708	12.334	170.747	0.964	0.957	41.695	-11.920	*	232.016	13.994	10.054
	1010.C	23.43	*		12.182	12.647	25.504	*	69.829	12.161	180.607	0.961	0.921	41.646	-16.179	*	221.394	15.469	11.248
			*					*								*			
880	940.C	29.52	*		12.216	12.745	27.690	*	71.773	11.882	87.774	0.964	2.028	41.566	31.479	*	-14.665	22.437	17.302
252	950.C	26.98	*		12.195	12.684	26.751	*	70.865	11.989	97.634	0.962	1.954	41.598	25.690	*	-23.166	19.615	14.786
	960.C	24.77	*		12.175	12.635	26.003	*	70.163	12.076	107.494	0.960	1.871	41.624	20.095	*	-33.092	17.069	12.586
	970.C	22.95	*		12.166	12.603	25.452	*	69.642	12.138	117.354	0.959	1.792	41.642	14.695	*	-44.854	14.901	10.783
	980.C	21.61	*		12.155	12.565	25.103	*	69.274	12.165	127.214	0.959	1.705	41.651	9.490	*	-58.735	13.232	9.454
	990.C	20.80	*		12.141	12.531	24.950	*	69.036	12.167	137.074	0.958	1.616	41.650	4.479	*	-74.531	12.195	8.659
	1000.C	20.54	*		12.125	12.484	24.989	*	68.905	12.128	146.934	0.956	1.000	41.635	-0.346	*	268.788	11.871	8.417
	1010.C	20.80	*		12.105	12.425	25.212	*	68.862	12.052	156.794	0.955	0.992	41.617	-4.992	*	252.787	12.237	8.691
	1020.C	21.48	*		12.079	12.352	25.610	*	68.891	11.940	166.654	0.952	0.972	41.584	-9.471	*	238.685	13.165	9.402
	1030.C	22.50	*		12.049	12.264	26.175	*	68.979	11.791	176.514	0.950	0.942	41.542	-13.797	*	226.863	14.489	10.450
			*					*								*			
905	970.C	27.98	*		12.053	12.273	28.323	*	70.547	11.458	93.540	0.952	2.005	41.445	26.576	*	-18.489	20.905	15.927
227	980.C	25.61	*		12.035	12.222	27.453	*	69.733	11.561	103.400	0.950	1.928	41.477	22.930	*	-27.548	18.226	13.576
	990.C	23.55	*		12.022	12.183	26.780	*	69.116	11.641	113.260	0.948	1.846	41.500	17.475	*	-38.222	15.862	11.573
	1000.C	22.01	*		12.011	12.150	26.310	*	68.667	11.693	123.120	0.947	1.761	41.514	12.210	*	-50.903	13.922	9.997
	1010.C	20.52	*		11.999	12.117	26.044	*	68.360	11.712	132.980	0.946	1.672	41.515	7.134	*	-65.713	12.537	8.919
	1020.C	20.27	*		11.986	12.078	25.977	*	68.172	11.696	142.840	0.945	1.581	41.515	2.244	*	-82.101	11.825	8.383
	1030.C	20.25	*		11.970	12.025	26.103	*	68.080	11.644	152.700	0.942	0.998	41.500	-2.470	*	261.302	11.828	8.385
	1040.C	20.82	*		11.949	11.968	26.413	*	68.069	11.554	162.560	0.942	0.985	41.475	-7.017	*	246.028	12.470	8.868
	1050.C	21.67	*		11.924	11.893	26.899	*	68.123	11.429	172.420	0.940	0.960	41.440	-11.409	*	232.933	13.600	9.742
	1060.C	22.60	*		11.895	11.803	27.555	*	68.232	11.268	182.280	0.939	0.925	41.396	-15.661	*	222.079	15.056	10.909
			*					*								*			
ECATE	TTIME	CV	SLM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMIC	VEL1	ALPHA1	*	PHI1	VINF1	CV1



TABLE XII. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 SATURN RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	CV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1	
544 188	1020.C	25.08	*	11.823	11.583	29.126	*	68.424	10.881	105.720	C.935	1.535	41.293	22.435	*-28.051	17.857	13.258
	1030.C	23.12	*	11.810	11.546	28.440	*	67.812	10.964	115.580	C.932	1.856	41.315	17.061	*-38.745	15.541	11.308
	1040.C	21.56	*	11.800	11.514	27.962	*	67.368	11.019	125.440	C.931	1.770	41.325	11.870	*-51.470	13.647	9.779
	1050.C	20.53	*	11.790	11.483	27.693	*	67.065	11.040	135.300	C.929	1.680	41.335	6.859	*-66.343	12.303	8.741
	1060.C	20.02	*	11.779	11.447	27.630	*	66.878	11.027	145.160	C.928	1.588	41.332	2.024	*-82.786	11.628	8.237
	1070.C	20.03	*	11.764	11.402	27.767	*	66.787	10.978	155.020	C.926	C.958	41.318	-2.643	*260.598	11.661	8.261
	1080.C	20.51	*	11.747	11.346	28.095	*	66.774	10.892	164.880	C.925	C.984	41.296	-7.152	*245.350	12.328	8.760
	1090.C	21.37	*	11.725	11.278	28.608	*	66.824	10.770	174.740	C.924	C.955	41.264	-11.517	*232.308	13.475	9.644
	1100.C	22.52	*	11.699	11.197	29.299	*	66.929	10.614	184.600	C.924	C.923	41.223	-15.753	*221.510	14.945	10.819
	1110.C	23.87	*	11.670	11.105	30.162	*	67.081	10.424	194.460	C.923	C.880	41.175	-19.876	*212.599	16.616	12.203
583 150	1060.C	24.55	*	11.637	10.997	30.848	*	67.038	10.254	108.040	C.922	1.950	41.132	21.523	*-28.641	17.498	12.951
	1070.C	22.68	*	11.625	10.960	30.151	*	66.434	10.340	117.900	C.919	1.866	41.153	16.625	*-39.375	15.232	11.053
	1080.C	21.15	*	11.617	10.931	29.662	*	66.000	10.398	127.760	C.916	1.778	41.168	11.501	*-52.173	13.384	9.572
	1090.C	20.18	*	11.607	10.902	29.394	*	65.702	10.422	137.620	C.914	1.687	41.174	6.551	*-67.128	12.085	8.577
	1100.C	19.71	*	11.597	10.868	29.337	*	65.518	10.410	147.480	C.913	1.554	41.171	1.768	*-83.634	11.452	8.108
	1110.C	19.74	*	11.585	10.827	29.487	*	65.427	10.363	157.340	C.912	C.957	41.155	-2.857	*259.745	11.522	8.159
	1120.C	20.25	*	11.565	10.776	29.837	*	65.411	10.280	167.200	C.911	C.983	41.138	-7.333	*244.548	12.218	8.677
	1120.C	21.12	*	11.550	10.714	30.380	*	65.458	10.161	177.060	C.911	C.957	41.105	-11.674	*231.583	13.387	9.574
	1140.C	22.25	*	11.528	10.641	31.108	*	65.558	10.008	186.920	C.911	C.921	41.071	-15.896	*220.861	14.874	10.761
	1150.C	23.66	*	11.503	10.558	32.018	*	65.704	9.822	196.780	C.912	C.877	41.026	-20.014	*212.014	16.560	12.156
1008 125	1080.C	25.51	*	11.538	10.674	32.464	*	66.535	9.818	103.946	C.917	2.002	41.025	24.634	*-23.742	18.681	13.970
	1090.C	23.43	*	11.525	10.631	31.641	*	65.829	9.921	113.806	C.913	1.920	41.050	19.285	*-33.510	16.260	11.904
	1100.C	21.72	*	11.515	10.598	31.032	*	65.308	9.995	123.666	C.909	1.833	41.068	14.107	*-45.143	14.191	10.211
	1110.C	20.47	*	11.507	10.569	30.641	*	64.938	10.039	133.526	C.907	1.744	41.079	9.099	*-58.953	12.596	8.964
	1120.C	19.72	*	11.498	10.541	30.464	*	64.699	10.050	143.386	C.905	1.651	41.082	4.255	*-74.775	11.606	8.220
	1130.C	19.49	*	11.488	10.506	30.505	*	64.559	10.024	153.246	C.904	1.000	41.075	-0.430	*268.439	11.308	8.003
	1140.C	19.76	*	11.475	10.463	30.755	*	64.502	9.962	163.106	C.903	C.952	41.060	-4.965	*252.300	11.689	8.282
	1150.C	20.45	*	11.460	10.411	31.207	*	64.513	9.865	172.966	C.903	C.972	41.037	-9.364	*238.082	12.629	8.989
	1160.C	21.47	*	11.441	10.345	31.854	*	64.580	9.732	182.826	C.903	C.941	41.005	-13.640	*226.185	13.967	10.032
	1170.C	22.75	*	11.420	10.276	32.690	*	64.696	9.566	192.686	C.904	C.901	40.966	-17.810	*216.385	15.564	11.326
1032 100	1110.C	24.27	*	11.434	10.324	33.226	*	65.244	9.510	109.713	C.908	1.973	40.953	21.940	*-28.235	17.368	12.840
	1120.C	22.38	*	11.423	10.286	32.489	*	64.630	9.602	119.573	C.904	1.888	40.974	16.710	*-38.805	15.118	10.960
	1130.C	20.50	*	11.414	10.256	31.972	*	64.185	9.664	129.433	C.900	1.795	40.985	11.646	*-51.426	13.271	9.484
	1140.C	19.85	*	11.406	10.227	31.678	*	63.878	9.694	139.293	C.898	1.708	40.996	6.747	*-66.243	11.955	8.479
	1150.C	19.35	*	11.397	10.197	31.606	*	63.684	9.688	149.153	C.896	1.613	40.995	2.004	*-82.705	11.291	7.990
	1160.C	19.40	*	11.387	10.162	31.745	*	63.587	9.649	159.013	C.896	C.958	40.985	-2.592	*260.582	11.326	8.016
	1170.C	19.88	*	11.375	10.118	32.099	*	63.560	9.573	168.873	C.895	C.984	40.967	-7.047	*245.220	11.992	8.507
	1180.C	20.74	*	11.355	10.065	32.657	*	63.593	9.461	178.733	C.896	C.955	40.942	-11.378	*232.078	13.142	9.384
	1190.C	21.90	*	11.342	10.003	33.413	*	63.678	9.315	188.593	C.897	C.924	40.908	-15.598	*221.206	14.620	10.556
	1200.C	23.27	*	11.322	9.932	34.362	*	63.808	9.137	198.453	C.898	C.880	40.868	-19.725	*212.242	16.307	11.944
1058 75	1120.C	25.20	*	11.352	10.038	34.904	*	64.679	9.107	105.620	C.905	2.025	40.861	24.591	*-23.475	18.539	13.847
	1140.C	23.14	*	11.335	9.993	34.040	*	63.965	9.216	115.480	C.899	1.942	40.886	19.311	*-33.103	16.141	11.805
	1150.C	21.45	*	11.325	9.960	33.395	*	63.437	9.296	125.340	C.895	1.854	40.904	14.195	*-44.582	14.082	10.124
	1160.C	20.20	*	11.321	9.931	32.976	*	63.062	9.345	135.200	C.892	1.764	40.915	9.239	*-58.247	12.482	8.877
	1170.C	19.44	*	11.313	9.903	32.783	*	62.812	9.360	145.060	C.890	1.670	40.918	4.440	*-73.971	11.471	8.122
	1180.C	19.15	*	11.305	9.872	32.815	*	62.662	9.340	154.920	C.889	1.000	40.914	-0.210	*269.227	11.144	7.884
	1190.C	19.43	*	11.294	9.835	33.066	*	62.594	9.284	164.780	C.888	C.953	40.901	-4.721	*252.971	11.496	8.140
	1200.C	20.11	*	11.282	9.790	33.529	*	62.591	9.193	174.640	C.885	C.973	40.880	-9.105	*238.592	12.414	8.825
	1210.C	21.12	*	11.267	9.738	34.193	*	62.648	9.069	184.500	C.890	C.943	40.853	-13.378	*226.538	13.741	9.853
	1220.C	22.35	*	11.250	9.677	35.063	*	62.747	8.910	194.360	C.891	C.903	40.818	-17.552	*216.617	15.336	11.139
ECATE	TTIME	CV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1	

ECATE	TIME	DV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMIC	VEL1	ALPHA1 *	PHI1	VINF1	DV1		
1063 50	1160.0	23.95	*	11.263	5.721	35.685	*	63.315	8.837	111.387	C.856	1.595	40.802	21.911	*	-27.967	17.239	12.730
	1170.0	22.12	*	11.252	5.681	34.911	*	62.697	8.935	121.247	C.851	1.505	40.823	16.743	*	-38.404	15.007	10.870
	1180.0	20.64	*	11.243	5.651	34.364	*	62.248	9.002	131.107	C.857	1.615	40.838	11.734	*	-50.886	13.165	9.401
	1190.0	19.63	*	11.236	5.623	34.046	*	61.936	9.036	140.967	C.854	1.726	40.845	6.880	*	-65.591	11.840	8.394
	1200.0	19.12	*	11.228	5.595	33.960	*	61.736	9.036	150.827	C.853	1.631	40.845	2.174	*	-82.015	11.154	7.891
	1210.0	19.12	*	11.215	5.563	34.099	*	61.625	9.001	160.687	C.852	C.558	40.838	-2.392	*	261.218	11.163	7.897
	1220.0	19.58	*	11.209	5.525	34.461	*	61.585	8.930	170.547	C.852	C.585	40.822	-6.829	*	245.725	11.806	8.369
	1230.0	20.43	*	11.197	5.480	35.037	*	61.603	8.824	180.407	C.853	C.560	40.795	-11.149	*	232.439	12.942	9.229
	1240.0	21.57	*	11.183	5.428	35.823	*	61.670	8.684	190.267	C.855	C.525	40.765	-15.369	*	221.444	14.415	10.390
1250.0	22.54	*	11.167	5.370	36.806	*	61.786	8.514	200.127	C.857	C.481	40.733	-19.507	*	212.378	16.106	11.776	
1108 25	1160.0	24.52	*	11.194	5.465	37.423	*	62.682	8.464	107.293	C.855	2.047	40.723	24.508	*	-23.325	18.396	13.723
	1190.0	22.89	*	11.181	5.422	36.521	*	61.966	8.578	117.153	C.858	1.963	40.747	19.292	*	-32.839	16.022	11.706
	1200.0	21.21	*	11.172	5.387	35.844	*	61.436	8.664	127.013	C.853	1.874	40.765	14.231	*	-44.195	13.977	10.040
	1210.0	19.56	*	11.164	5.358	35.398	*	61.058	8.717	136.873	C.850	1.782	40.776	9.324	*	-57.743	12.378	8.797
	1220.0	19.19	*	11.157	5.332	35.188	*	60.803	8.736	146.733	C.877	1.688	40.780	4.564	*	-73.394	11.354	8.036
	1230.0	18.93	*	11.145	5.303	35.211	*	60.647	8.721	156.593	C.876	1.000	40.777	-0.056	*	269.793	11.007	7.785
	1240.0	19.17	*	11.141	5.271	35.463	*	60.568	8.670	166.453	C.876	C.592	40.766	-4.545	*	253.446	11.338	8.024
	1250.0	19.82	*	11.131	5.233	35.940	*	60.552	8.584	176.313	C.877	C.574	40.748	-8.916	*	238.940	12.240	8.694
	1260.0	20.83	*	11.115	5.188	36.634	*	60.587	8.464	186.173	C.878	C.544	40.723	-13.182	*	226.771	13.559	9.710
1270.0	22.10	*	11.106	5.137	37.540	*	60.666	8.311	196.033	C.881	C.505	40.651	-17.361	*	216.753	15.154	10.989	
1123 C	1210.0	23.74	*	11.117	5.162	38.224	*	61.245	8.228	113.060	C.886	2.016	40.674	21.840	*	-27.821	17.109	12.620
	1220.0	21.89	*	11.106	5.140	37.417	*	60.628	8.330	122.920	C.880	1.925	40.695	16.730	*	-38.152	14.897	10.780
	1230.0	20.42	*	11.098	5.108	36.841	*	60.179	8.401	132.780	C.876	1.838	40.710	11.771	*	-50.525	13.063	9.323
	1240.0	19.41	*	11.091	5.081	36.503	*	59.865	8.440	142.640	C.873	1.744	40.718	6.559	*	-65.142	11.735	8.316
	1250.0	18.85	*	11.084	5.055	36.404	*	59.660	8.444	152.500	C.871	1.647	40.715	2.286	*	-81.536	11.036	7.806
	1260.0	18.88	*	11.077	5.026	36.541	*	59.541	8.413	162.360	C.870	C.598	40.712	-2.254	*	261.650	11.027	7.800
	1270.0	19.33	*	11.068	4.994	36.911	*	59.489	8.347	172.220	C.871	C.585	40.698	-6.675	*	246.055	11.656	8.257
	1280.0	20.16	*	11.059	4.956	37.506	*	59.492	8.246	182.080	C.872	0.561	40.678	-10.988	*	232.657	12.782	9.106
	1290.0	21.31	*	11.048	4.913	38.323	*	59.539	8.112	191.940	C.875	C.526	40.651	-15.209	*	221.566	14.254	10.261
1300.0	22.68	*	11.036	4.865	39.354	*	59.626	7.945	201.800	C.878	C.482	40.618	-19.354	*	212.430	15.948	11.645	
1156 352	1230.0	24.66	*	11.060	4.961	40.016	*	60.536	7.882	108.967	C.886	2.068	40.606	24.387	*	-23.278	18.251	13.598
	1240.0	22.65	*	11.047	4.910	39.082	*	59.824	8.001	118.827	C.879	1.983	40.629	19.230	*	-32.704	15.902	11.606
	1250.0	21.00	*	11.038	4.873	38.375	*	59.298	8.090	128.687	C.873	1.852	40.647	14.221	*	-43.964	13.873	9.958
	1260.0	19.75	*	11.030	4.844	37.907	*	58.921	8.147	138.547	C.869	1.600	40.658	9.358	*	-57.423	12.279	8.722
	1270.0	18.58	*	11.024	4.818	37.681	*	58.665	8.170	148.407	C.867	1.704	40.663	4.635	*	-73.020	11.250	7.961
	1280.0	18.72	*	11.017	4.792	37.698	*	58.503	8.159	158.267	C.865	1.606	40.660	0.043	*	-89.838	10.890	7.701
	1290.0	18.94	*	11.010	4.764	37.954	*	58.414	8.112	168.127	C.865	C.554	40.651	-4.427	*	253.743	11.208	7.930
	1300.0	19.55	*	11.002	4.732	38.445	*	58.383	8.031	177.987	C.867	C.575	40.635	-8.786	*	239.140	12.101	8.589
	1310.0	20.55	*	10.993	4.695	39.165	*	58.399	7.915	187.847	C.865	C.545	40.612	-13.050	*	226.881	13.417	9.598
1320.0	21.86	*	10.983	4.655	40.107	*	58.455	7.767	197.707	C.872	C.506	40.584	-17.234	*	216.789	15.014	10.875	
1183 327	1260.0	23.50	*	10.994	4.695	40.837	*	59.026	7.676	114.733	C.878	2.036	40.566	21.730	*	-27.784	16.976	12.507
	1270.0	21.67	*	10.983	4.654	40.002	*	58.416	7.782	124.593	C.871	1.948	40.586	16.674	*	-38.034	14.785	10.689
	1280.0	20.22	*	10.974	4.621	39.402	*	57.972	7.857	134.453	C.866	1.856	40.601	11.762	*	-50.327	12.964	9.246
	1290.0	19.21	*	10.968	4.593	39.046	*	57.660	7.899	144.313	C.863	1.760	40.609	6.988	*	-64.879	11.638	8.244
	1300.0	18.65	*	10.962	4.565	38.937	*	57.453	7.907	154.173	C.861	1.662	40.611	2.347	*	-81.252	10.934	7.732
	1310.0	18.67	*	10.955	4.543	39.075	*	57.326	7.879	164.033	C.861	C.598	40.605	-2.172	*	261.896	10.915	7.719
	1320.0	19.12	*	10.949	4.516	39.454	*	57.262	7.817	173.893	C.861	C.586	40.593	-6.578	*	246.226	11.535	8.168
	1330.0	19.55	*	10.941	4.485	40.070	*	57.246	7.721	183.753	C.863	C.562	40.575	-10.885	*	232.747	12.657	9.010
	1340.0	21.09	*	10.933	4.450	40.918	*	57.270	7.591	193.613	C.866	C.527	40.550	-15.107	*	221.586	14.130	10.162
1350.0	22.47	*	10.924	4.414	41.991	*	57.330	7.429	203.473	C.870	C.482	40.520	-19.263	*	212.395	15.831	11.547	
ECATE	TIME	DV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMIC	VEL1	ALPHA1 *	PHI1	VINF1	DV1		

TABLE XII. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

PARKING ORBIT TO 1.1 SATURN RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	CV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1	
1206 302	1200.0	24.42	*	10.546	8.507	42.679	*	58.234	7.356	110.640	0.878	2.088	40.507	24.231	*-23.324	18.104	13.471
	1290.0	22.44	*	10.933	8.452	41.718	*	57.533	7.478	120.500	0.870	2.002	40.525	19.130	*-32.683	15.780	11.505
	1300.0	20.80	*	10.923	8.413	40.987	*	57.016	7.570	130.360	0.864	1.911	40.546	14.169	*-43.874	13.769	9.875
	1310.0	19.57	*	10.916	8.382	40.499	*	56.646	7.631	140.220	0.860	1.816	40.558	9.347	*-57.271	12.183	8.651
	1320.0	18.60	*	10.910	8.357	40.261	*	56.391	7.657	150.080	0.856	1.719	40.563	4.657	*-72.831	11.156	7.892
	1330.0	18.54	*	10.904	8.333	40.274	*	56.224	7.649	159.940	0.856	1.619	40.561	0.091	*-89.659	10.791	7.631
	1340.0	18.75	*	10.898	8.309	40.536	*	56.126	7.605	169.800	0.857	0.954	40.553	-4.362	*253.872	11.102	7.854
	1350.0	19.40	*	10.892	8.282	41.043	*	56.079	7.528	179.660	0.856	0.975	40.538	-8.712	*239.201	11.992	8.507
	1360.0	20.40	*	10.885	8.253	41.789	*	56.073	7.416	189.520	0.860	0.945	40.518	-12.974	*226.878	13.308	9.513
1370.0	21.67	*	10.878	8.222	42.768	*	56.101	7.272	199.380	0.864	0.906	40.492	-17.164	*216.735	14.911	10.791	
1233 277	1310.0	23.28	*	10.889	8.268	43.521	*	56.650	7.177	116.407	0.871	2.055	40.475	21.587	*-27.845	16.841	12.393
	1320.0	21.47	*	10.877	8.220	42.661	*	56.055	7.286	126.267	0.863	1.965	40.494	16.580	*-38.038	14.672	10.597
	1330.0	20.04	*	10.869	8.184	42.041	*	55.622	7.364	136.127	0.858	1.812	40.508	11.711	*-50.277	12.865	9.170
	1340.0	19.04	*	10.862	8.156	41.672	*	55.316	7.409	145.987	0.855	1.776	40.517	6.973	*-64.788	11.547	8.177
	1350.0	18.52	*	10.857	8.133	41.556	*	55.108	7.419	155.847	0.853	1.676	40.518	2.359	*-81.151	10.843	7.668
	1360.0	18.50	*	10.852	8.110	41.696	*	54.975	7.395	165.707	0.852	0.958	40.514	-2.138	*261.970	10.822	7.653
	1370.0	18.54	*	10.846	8.087	42.087	*	54.897	7.336	175.567	0.853	0.986	40.503	-6.532	*246.248	11.439	8.098
	1380.0	19.78	*	10.841	8.063	42.725	*	54.861	7.243	185.427	0.855	0.962	40.486	-10.834	*232.715	12.562	8.938
	1390.0	20.92	*	10.834	8.037	43.604	*	54.858	7.117	195.287	0.855	0.927	40.464	-15.060	*221.508	14.039	10.090
1400.0	22.31	*	10.828	8.010	44.718	*	54.884	6.958	205.147	0.862	0.882	40.437	-19.225	*212.281	15.749	11.480	
1256 252	1330.0	24.19	*	10.845	8.101	45.412	*	55.763	6.879	112.314	0.872	2.108	40.423	24.046	*-23.450	17.954	13.342
	1340.0	22.24	*	10.836	8.043	44.423	*	55.088	7.005	122.174	0.863	2.019	40.445	18.994	*-32.766	15.655	11.401
	1350.0	20.62	*	10.826	8.001	43.672	*	54.588	7.100	132.034	0.857	1.927	40.461	14.075	*-43.913	13.662	9.791
	1360.0	19.40	*	10.819	7.965	43.170	*	54.228	7.163	141.894	0.853	1.832	40.472	9.294	*-57.273	12.090	8.581
	1370.0	18.64	*	10.813	7.943	42.923	*	53.977	7.192	151.754	0.850	1.733	40.477	4.634	*-72.815	11.069	7.830
	1380.0	18.38	*	10.808	7.921	42.935	*	53.808	7.186	161.614	0.845	1.622	40.476	0.092	*-89.655	10.706	7.571
	1390.0	18.60	*	10.803	7.900	43.205	*	53.699	7.146	171.474	0.845	0.954	40.465	-4.345	*253.843	11.018	7.793
	1400.0	19.24	*	10.798	7.875	43.729	*	53.634	7.071	181.334	0.851	0.975	40.456	-8.687	*239.130	11.909	8.445
	1410.0	20.25	*	10.793	7.858	44.502	*	53.602	6.962	191.194	0.853	0.945	40.437	-12.949	*226.769	13.229	9.452
1420.0	21.52	*	10.789	7.836	45.517	*	53.597	6.822	201.054	0.858	0.906	40.413	-17.146	*216.596	14.840	10.734	
1283 227	1360.0	23.07	*	10.799	7.883	46.273	*	54.110	6.725	118.080	0.864	2.073	40.397	21.412	*-27.991	16.702	12.275
	1370.0	21.29	*	10.788	7.832	45.390	*	53.542	6.838	127.940	0.857	1.982	40.416	16.451	*-38.152	14.555	10.503
	1380.0	19.67	*	10.779	7.794	44.755	*	53.126	6.919	137.800	0.851	1.887	40.430	11.621	*-50.361	12.766	9.094
	1390.0	18.85	*	10.773	7.765	44.375	*	52.830	6.965	147.660	0.848	1.790	40.438	6.916	*-64.855	11.459	8.113
	1400.0	18.38	*	10.768	7.742	44.256	*	52.624	6.978	157.520	0.846	1.685	40.440	2.328	*-81.220	10.763	7.610
	1410.0	18.36	*	10.763	7.722	44.399	*	52.484	6.956	167.380	0.845	0.958	40.436	-2.151	*261.880	10.745	7.598
	1420.0	18.80	*	10.759	7.703	44.804	*	52.391	6.899	177.240	0.846	0.986	40.426	-6.533	*246.129	11.366	8.045
	1430.0	19.64	*	10.755	7.685	45.464	*	52.332	6.809	187.100	0.845	0.962	40.411	-10.832	*232.567	12.494	8.886
	1440.0	20.75	*	10.751	7.667	46.375	*	52.297	6.686	196.960	0.852	0.927	40.391	-15.061	*221.338	13.979	10.041
1450.0	22.19	*	10.747	7.651	47.529	*	52.283	6.531	206.820	0.857	0.882	40.365	-19.238	*212.093	15.699	11.438	
ECATE	TTIME	CV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1	

ECATE	TTIME	DV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1
1322	1390.C	24.76	*	10.753	7.678	49.433 *	52.679	6.279	110.540	C.666	2.165	4C.325	25.782 *	-20.452	18.719	14.003
18E	1400.C	22.72	*	10.737	7.606	48.348 *	51.957	6.419	120.400	0.859	2.077	4C.347	20.741 *	-29.128	16.358	11.986
	1410.C	20.95	*	10.726	7.553	47.489 *	51.423	6.529	130.260	0.852	1.885	4C.365	15.829 *	-39.462	14.261	10.267
	1420.C	19.62	*	10.718	7.516	46.864 *	51.044	6.608	140.120	C.846	1.885	4C.378	11.039 *	-51.900	12.530	8.913
	1430.C	18.70	*	10.711	7.487	46.506 *	50.768	6.653	149.980	0.842	1.785	4C.385	6.370 *	-66.624	11.293	7.991
	1440.C	18.25	*	10.707	7.465	46.414 *	50.571	6.663	159.840	C.841	1.688	4C.387	1.812 *	-83.129	10.673	7.547
	1450.C	18.25	*	10.703	7.447	46.591 *	50.431	6.639	169.700	C.840	C.558	4C.383	-2.644 *	260.003	10.733	7.589
	1460.C	18.76	*	10.699	7.432	47.033 *	50.329	6.581	179.560	0.842	0.584	4C.373	-7.010 *	244.437	11.419	8.084
	1470.C	19.66	*	10.697	7.418	47.738 *	50.252	6.489	189.420	C.845	C.558	4C.358	-11.299 *	231.117	12.597	8.964
	1480.C	20.85	*	10.694	7.407	48.699 *	50.190	6.364	199.280	C.845	C.522	4C.335	-15.527 *	220.110	14.119	10.153
1361	1420.C	24.37	*	10.658	7.426	51.523 *	50.375	5.999	112.860	C.864	2.165	4C.282	25.054 *	-21.507	18.335	13.671
150	1440.C	22.39	*	10.683	7.353	50.454 *	49.712	6.138	122.720	C.854	2.080	4C.303	20.063 *	-30.326	16.018	11.702
	1450.C	20.71	*	10.671	7.295	49.612 *	49.224	6.246	132.580	C.847	1.986	4C.320	15.194 *	-40.858	13.972	10.036
	1460.C	19.40	*	10.663	7.260	49.020 *	48.868	6.321	142.440	C.841	1.885	4C.332	10.446 *	-53.532	12.302	8.740
	1470.C	18.54	*	10.657	7.233	48.679 *	48.620	6.364	152.300	C.838	1.788	4C.339	5.808 *	-68.499	11.136	7.878
	1480.C	18.15	*	10.653	7.212	48.617 *	48.433	6.372	162.160	C.836	1.685	4C.340	1.277 *	-85.135	10.598	7.494
	1490.C	18.24	*	10.650	7.196	48.829 *	48.291	6.346	172.020	C.836	C.557	4C.336	-3.155 *	258.054	10.737	7.592
	1500.C	18.78	*	10.647	7.184	49.312 *	48.176	6.285	181.880	C.838	C.581	4C.326	-7.510 *	242.695	11.490	8.136
	1510.C	19.70	*	10.645	7.176	50.062 *	48.076	6.192	191.740	0.841	C.554	4C.312	-11.792 *	229.632	12.719	9.058
	1520.C	20.53	*	10.644	7.171	51.073 *	47.981	6.065	201.600	0.846	C.517	4C.292	-16.019 *	218.855	14.279	10.281
1366	1450.C	25.34	*	10.677	7.327	53.565 *	49.291	5.741	108.766	C.867	2.221	4C.245	27.449 *	-17.767	19.480	14.668
125	1460.C	23.25	*	10.659	7.241	52.392 *	48.553	5.895	118.626	0.856	2.123	4C.267	22.417 *	-25.894	17.069	12.586
	1470.C	21.42	*	10.646	7.177	51.431 *	48.008	6.020	128.486	C.848	2.041	4C.286	17.508 *	-35.515	14.889	10.774
	1480.C	19.93	*	10.636	7.130	50.709 *	47.610	6.113	138.346	0.841	1.945	4C.300	12.717 *	-47.083	13.028	9.296
	1490.C	18.85	*	10.629	7.095	50.246 *	47.319	6.172	148.206	0.837	1.845	4C.305	8.040 *	-60.931	11.604	8.219
	1500.C	18.22	*	10.624	7.072	50.042 *	47.113	6.199	158.066	0.824	1.742	4C.313	3.468 *	-76.889	10.749	7.601
	1510.C	18.05	*	10.620	7.055	50.120 *	46.950	6.190	167.926	0.824	1.600	4C.311	-1.006 *	266.157	10.559	7.466
	1520.C	18.42	*	10.618	7.043	50.475 *	46.816	6.147	177.786	C.835	0.590	4C.305	-5.393 *	249.909	11.027	7.800
	1530.C	19.16	*	10.616	7.035	51.103 *	46.695	6.071	187.646	0.837	C.565	4C.293	-9.706 *	235.666	12.045	8.547
	1540.C	20.25	*	10.616	7.032	51.997 *	46.578	5.961	197.506	0.841	C.536	4C.277	-13.561 *	223.796	13.462	9.634
1411	1480.C	24.16	*	10.635	7.145	54.394 *	47.369	5.654	114.533	C.855	2.186	4C.233	24.775 *	-21.847	18.164	13.523
100	1490.C	22.21	*	10.623	7.069	53.321 *	46.767	5.796	124.393	C.850	2.095	4C.253	19.826 *	-30.672	15.873	11.582
	1500.C	20.55	*	10.612	7.012	52.476 *	46.325	5.905	134.253	C.842	2.000	4C.265	14.594 *	-41.221	13.851	9.940
	1510.C	19.27	*	10.603	6.971	51.881 *	46.002	5.982	144.113	0.837	1.901	4C.280	10.277 *	-53.925	12.204	8.666
	1520.C	18.42	*	10.597	6.941	51.553 *	45.761	6.024	153.973	C.823	1.755	4C.286	5.667 *	-68.919	11.060	7.823
	1530.C	18.05	*	10.593	6.922	51.490 *	45.586	6.034	163.833	0.821	1.655	4C.288	1.154 *	-85.587	10.541	7.454
	1540.C	18.16	*	10.591	6.909	51.712 *	45.435	6.008	173.693	C.822	C.556	4C.284	-3.269 *	257.600	10.698	7.565
	1550.C	18.71	*	10.585	6.901	52.212 *	45.297	5.949	183.553	C.824	C.581	4C.275	-7.615 *	242.264	11.468	8.119
	1560.C	19.64	*	10.585	6.895	52.986 *	45.161	5.857	193.413	C.837	C.553	4C.262	-11.897 *	229.231	12.711	9.051
	1570.C	20.86	*	10.590	6.903	54.024 *	45.015	5.733	203.273	C.842	C.515	4C.244	-16.132 *	218.484	14.284	10.286
1436	1500.C	25.13	*	10.623	7.066	56.443 *	46.163	5.415	110.440	C.863	2.227	4C.200	27.136 *	-18.134	19.293	14.504
75	1510.C	23.06	*	10.604	6.976	55.278 *	45.494	5.571	120.300	C.852	2.145	4C.221	22.149 *	-26.265	16.910	12.451
	1520.C	21.26	*	10.591	6.906	54.315 *	45.011	5.698	130.160	C.844	2.055	4C.239	17.277 *	-35.907	14.754	10.664
	1530.C	19.75	*	10.581	6.858	53.593 *	44.656	5.791	140.020	0.837	1.957	4C.252	12.520 *	-47.508	12.917	9.210
	1540.C	18.73	*	10.574	6.822	53.131 *	44.393	5.851	149.880	0.822	1.856	4C.261	7.870 *	-61.401	11.517	8.155
	1550.C	18.12	*	10.569	6.798	52.943 *	44.190	5.877	159.740	0.830	1.752	4C.265	3.321 *	-77.390	10.685	7.555
	1560.C	18.00	*	10.566	6.783	53.024 *	44.031	5.870	169.600	C.825	1.600	4C.264	-1.139 *	265.635	10.516	7.436
	1570.C	18.35	*	10.564	6.774	53.393 *	43.880	5.828	179.460	C.820	C.590	4C.257	-5.517 *	249.406	11.004	7.783
	1580.C	19.11	*	10.564	6.772	54.040 *	43.728	5.753	189.320	C.823	C.568	4C.247	-9.829 *	235.202	12.039	8.542
	1590.C	20.21	*	10.565	6.776	54.960 *	43.564	5.646	199.180	0.838	C.535	4C.231	-14.088 *	223.373	13.471	9.641
ECATE	TTIME	DV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1

TABLE XII. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 SATURN RADII CIRCULAR PARKING ORBIT

ECATE	TIME	CV	SUM	*	OV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	OV1
1461 5C	1530.C	23.96	*	10.589	6.895	57.283	*	44.196	5.349	116.207	0.856	2.201	4C.191	24.474	*	-22.243	17.989	13.372	
	1540.C	22.03	*	10.573	6.818	56.224	*	43.660	5.490	126.067	0.846	2.109	4C.210	19.566	*	-31.084	15.724	11.458	
	1550.C	20.40	*	10.561	6.758	55.378	*	43.278	5.601	135.927	0.836	2.013	4C.225	14.768	*	-41.670	13.727	9.842	
	1560.C	19.14	*	10.552	6.715	54.786	*	42.994	5.678	145.787	0.823	1.913	4C.236	10.680	*	-54.424	12.104	8.591	
	1570.C	18.32	*	10.547	6.685	54.462	*	42.776	5.721	155.647	0.829	1.805	4C.242	5.493	*	-69.472	10.985	7.769	
	1580.C	17.56	*	10.543	6.665	54.418	*	42.596	5.730	165.507	0.827	1.703	4C.243	0.999	*	-86.165	10.491	7.419	
	1590.C	18.05	*	10.541	6.655	54.646	*	42.442	5.706	175.367	0.828	0.956	4C.240	-3.414	*	-257.024	10.671	7.546	
	1600.C	18.65	*	10.540	6.652	55.163	*	42.279	5.648	185.227	0.820	0.980	4C.232	-7.755	*	-241.728	11.461	8.114	
	1610.C	19.60	*	10.541	6.656	55.958	*	42.100	5.558	195.087	0.834	0.952	4C.219	-12.039	*	-228.747	12.722	9.060	
	1620.C	20.85	*	10.543	6.668	57.021	*	41.897	5.435	204.947	0.835	0.914	4C.202	-16.281	*	-218.045	14.312	10.307	
1486 25	1550.C	24.91	*	10.577	6.836	59.328	*	42.866	5.127	112.113	0.860	2.253	4C.162	26.803	*	-18.549	19.103	14.337	
	1560.C	22.87	*	10.558	6.743	58.178	*	42.283	5.285	121.973	0.849	2.163	4C.182	21.858	*	-26.699	16.745	12.312	
	1570.C	21.10	*	10.544	6.671	57.234	*	41.859	5.410	131.832	0.840	2.066	4C.199	17.024	*	-36.370	14.616	10.553	
	1580.C	19.66	*	10.534	6.619	56.512	*	41.562	5.505	141.693	0.833	1.965	4C.212	12.296	*	-48.025	12.804	9.123	
	1590.C	18.62	*	10.527	6.582	56.056	*	41.332	5.565	151.553	0.829	1.866	4C.220	7.671	*	-61.982	11.430	8.091	
	1600.C	18.02	*	10.522	6.558	55.875	*	41.144	5.591	161.413	0.826	1.761	4C.224	3.142	*	-78.025	10.625	7.513	
	1610.C	17.92	*	10.520	6.543	55.978	*	40.973	5.584	171.272	0.826	0.955	4C.223	-1.303	*	-264.995	10.482	7.413	
	1620.C	18.29	*	10.519	6.539	56.356	*	40.810	5.543	181.133	0.827	0.985	4C.217	-5.675	*	-248.794	10.994	7.776	
	1630.C	19.07	*	10.519	6.542	57.022	*	40.622	5.469	190.993	0.820	0.967	4C.207	-9.985	*	-234.648	12.050	8.550	
	1640.C	20.18	*	10.521	6.553	57.962	*	40.404	5.363	200.852	0.825	0.933	4C.193	-14.250	*	-222.877	13.500	9.664	
1511 C	1580.C	23.76	*	10.546	6.683	60.180	*	40.865	5.079	117.880	0.852	2.216	4C.156	24.154	*	-22.650	17.810	13.218	
	1590.C	21.86	*	10.530	6.598	59.134	*	40.414	5.221	127.740	0.842	2.122	4C.174	19.282	*	-31.565	15.570	11.331	
	1600.C	20.26	*	10.518	6.535	58.312	*	40.084	5.331	137.600	0.835	2.024	4C.188	14.520	*	-42.196	13.600	9.742	
	1610.C	19.03	*	10.505	6.490	57.722	*	39.853	5.408	147.460	0.829	1.923	4C.195	9.857	*	-55.021	12.004	8.516	
	1620.C	18.22	*	10.504	6.455	57.407	*	39.661	5.452	157.320	0.826	1.816	4C.205	5.291	*	-70.139	10.912	7.717	
	1630.C	17.85	*	10.500	6.441	57.372	*	39.489	5.461	167.180	0.824	1.710	4C.206	0.813	*	-86.871	10.447	7.388	
	1640.C	18.03	*	10.499	6.433	57.624	*	39.313	5.437	177.040	0.824	0.956	4C.202	-3.589	*	-256.339	10.655	7.534	
	1650.C	18.62	*	10.499	6.433	58.161	*	39.117	5.379	186.900	0.827	0.979	4C.195	-7.926	*	-241.103	11.469	8.120	
	1660.C	19.58	*	10.501	6.444	58.966	*	38.901	5.291	196.760	0.831	0.951	4C.183	-12.214	*	-228.186	12.751	9.082	
	1670.C	20.85	*	10.504	6.464	60.049	*	38.631	5.169	206.620	0.836	0.912	4C.167	-16.465	*	-217.545	14.359	10.345	
1536 252	1600.C	24.71	*	10.538	6.636	62.215	*	39.403	4.875	113.787	0.857	2.266	4C.131	26.454	*	-19.008	18.908	14.168	
	1610.C	22.69	*	10.519	6.539	61.087	*	38.923	5.032	123.647	0.846	2.176	4C.150	21.547	*	-27.188	16.577	12.170	
	1620.C	20.94	*	10.504	6.464	60.155	*	38.583	5.158	133.507	0.837	2.080	4C.166	16.746	*	-36.910	14.474	10.438	
	1630.C	19.53	*	10.494	6.409	59.462	*	38.327	5.251	143.367	0.830	1.979	4C.178	12.050	*	-48.626	12.690	9.035	
	1640.C	18.52	*	10.487	6.371	59.008	*	38.144	5.312	153.227	0.825	1.875	4C.186	7.447	*	-62.668	11.343	8.028	
	1650.C	17.96	*	10.483	6.347	58.838	*	37.974	5.338	163.087	0.823	1.766	4C.189	2.935	*	-78.774	10.569	7.473	
	1660.C	17.68	*	10.480	6.335	58.953	*	37.802	5.330	172.947	0.822	0.955	4C.188	-1.498	*	-264.233	10.458	7.395	
	1670.C	18.26	*	10.480	6.333	59.355	*	37.608	5.290	182.807	0.824	0.988	4C.183	-5.863	*	-248.085	10.997	7.778	
	1680.C	19.05	*	10.482	6.341	60.041	*	37.376	5.216	192.667	0.827	0.966	4C.173	-10.173	*	-234.017	12.076	8.570	
	1690.C	20.19	*	10.485	6.360	60.991	*	37.107	5.112	202.527	0.822	0.931	4C.160	-14.444	*	-222.317	13.547	9.701	
1561 327	1620.C	23.57	*	10.510	6.454	63.076	*	37.385	4.843	119.552	0.845	2.225	4C.127	23.816	*	-23.186	17.627	13.061	
	1640.C	21.70	*	10.494	6.406	62.053	*	37.032	4.985	129.413	0.839	2.134	4C.144	18.979	*	-32.105	15.413	11.202	
	1650.C	20.12	*	10.481	6.341	61.243	*	36.781	5.095	139.273	0.832	2.035	4C.158	14.246	*	-42.807	13.470	9.639	
	1660.C	18.91	*	10.473	6.293	60.685	*	36.580	5.170	149.132	0.826	1.932	4C.167	9.611	*	-55.708	11.903	8.440	
	1670.C	18.13	*	10.467	6.263	60.373	*	36.427	5.214	158.993	0.823	1.826	4C.173	5.063	*	-70.914	10.842	7.667	
	1680.C	17.83	*	10.464	6.245	60.352	*	36.263	5.223	168.853	0.821	1.717	4C.174	0.599	*	-87.689	10.411	7.362	
	1690.C	17.95	*	10.463	6.240	60.616	*	36.076	5.199	178.713	0.822	0.955	4C.171	-3.795	*	-255.544	10.650	7.531	
	1700.C	18.60	*	10.464	6.245	61.168	*	35.848	5.142	188.573	0.824	0.978	4C.164	-8.129	*	-240.382	11.492	8.137	
	1710.C	19.58	*	10.467	6.261	62.000	*	35.565	5.054	198.433	0.826	0.945	4C.153	-12.419	*	-227.559	12.796	9.117	
	1720.C	20.87	*	10.472	6.285	63.091	*	35.228	4.934	208.293	0.824	0.909	4C.138	-16.681	*	-216.989	14.424	10.398	
ECATE	TIME	CV	SUM	*	OV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	CV1

ECATE	TTIME	DV	SLM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	CV1
1586 502	1650.C	24.50	*	10.505	6.464	65.090	*	35.795	4.655	115.460	C.854	2.282	4C.104	26.089	*	-19.509	18.711	13.996	
	1660.C	22.51	*	10.485	6.362	63.991	*	35.431	4.812	125.320	C.843	2.188	4C.123	21.218	*	-27.729	16.405	12.026	
	1670.C	20.75	*	10.471	6.284	63.093	*	35.169	4.937	135.180	C.834	2.091	4C.138	16.450	*	-37.510	14.329	10.321	
	1680.C	19.41	*	10.461	6.227	62.405	*	34.993	5.030	145.040	C.827	1.989	4C.150	11.778	*	-49.318	12.572	8.945	
	1690.C	18.42	*	10.454	6.188	61.973	*	34.845	5.089	154.900	C.823	1.883	4C.157	7.198	*	-63.453	11.258	7.966	
	1700.C	17.85	*	10.445	6.164	61.817	*	34.693	5.115	164.760	C.820	1.775	4C.160	2.702	*	-79.632	10.517	7.437	
	1710.C	17.82	*	10.448	6.154	61.946	*	34.518	5.107	174.620	C.820	C.555	4C.159	-1.721	*	263.367	10.441	7.384	
	1720.C	18.24	*	10.448	6.156	62.361	*	34.301	5.067	184.480	C.822	C.588	4C.154	-6.081	*	247.279	11.013	7.789	
	1730.C	19.05	*	10.450	6.165	63.061	*	34.025	4.995	194.340	C.825	C.564	4C.145	-10.392	*	233.304	12.118	8.602	
	1740.C	20.21	*	10.455	6.194	64.035	*	33.675	4.891	204.200	C.830	C.525	4C.132	-14.665	*	221.699	13.611	9.751	
1611 277	1670.C	25.47	*	10.502	6.445	67.116	*	34.146	4.468	111.367	C.855	2.233	4C.083	28.365	*	-16.111	19.822	14.968	
	1680.C	23.38	*	10.480	6.332	65.957	*	33.778	4.640	121.227	C.847	2.242	4C.103	23.461	*	-23.727	17.440	12.901	
	1690.C	21.53	*	10.463	6.240	64.965	*	33.533	4.780	131.087	C.837	2.145	4C.115	18.658	*	-32.703	15.252	11.070	
	1700.C	19.55	*	10.451	6.172	64.187	*	33.352	4.888	140.947	C.825	2.045	4C.132	13.953	*	-43.483	13.337	9.536	
	1710.C	18.81	*	10.442	6.124	63.631	*	33.224	4.964	150.807	C.822	1.940	4C.141	9.339	*	-56.495	11.800	8.364	
	1720.C	18.06	*	10.437	6.092	63.347	*	33.091	5.006	160.667	C.820	1.832	4C.147	4.811	*	-71.792	10.775	7.619	
	1730.C	17.77	*	10.434	6.076	63.340	*	32.934	5.015	170.527	C.819	1.722	4C.148	0.359	*	-88.612	10.380	7.341	
	1740.C	17.57	*	10.433	6.073	63.619	*	32.733	4.991	180.387	C.815	C.555	4C.145	-4.028	*	254.656	10.655	7.534	
	1750.C	18.60	*	10.435	6.083	64.184	*	32.469	4.934	190.247	C.822	C.577	4C.138	-8.361	*	239.584	11.528	8.163	
	1760.C	19.60	*	10.435	6.105	65.028	*	32.128	4.847	200.107	C.827	C.547	4C.127	-12.655	*	226.863	12.857	9.164	
1636 252	1700.C	24.30	*	10.477	6.315	67.940	*	32.065	4.468	117.134	C.851	2.254	4C.083	25.708	*	-20.049	18.509	13.821	
	1710.C	22.34	*	10.458	6.210	66.878	*	31.832	4.623	126.994	C.840	2.200	4C.101	20.872	*	-28.321	16.229	11.879	
	1720.C	20.65	*	10.443	6.125	66.000	*	31.678	4.747	136.854	C.831	2.101	4C.115	16.132	*	-38.182	14.180	10.202	
	1730.C	19.25	*	10.433	6.070	65.350	*	31.555	4.838	146.714	C.825	1.997	4C.126	11.487	*	-50.086	12.454	8.855	
	1740.C	18.32	*	10.426	6.030	64.935	*	31.452	4.896	156.574	C.820	1.890	4C.133	6.526	*	-64.332	11.173	7.904	
	1750.C	17.82	*	10.421	6.007	64.797	*	31.319	4.921	166.434	C.818	1.780	4C.136	2.444	*	-80.591	10.470	7.404	
	1760.C	17.60	*	10.420	5.995	64.941	*	31.140	4.913	176.294	C.818	C.555	4C.135	-1.569	*	262.405	10.433	7.378	
	1770.C	18.23	*	10.421	6.004	65.370	*	30.896	4.873	186.154	C.820	C.587	4C.130	-6.325	*	246.391	11.040	7.809	
	1780.C	19.07	*	10.424	6.022	66.080	*	30.570	4.801	196.014	C.823	C.562	4C.122	-10.639	*	232.526	12.174	8.644	
	1790.C	20.24	*	10.430	6.055	67.063	*	30.146	4.699	205.874	C.825	C.527	4C.110	-14.523	*	221.024	13.691	9.814	
1661 227	1720.C	25.25	*	10.476	6.313	69.926	*	30.286	4.296	113.040	C.856	2.246	4C.064	27.960	*	-16.650	19.607	14.779	
	1730.C	23.15	*	10.454	6.192	68.811	*	30.071	4.467	122.900	C.844	2.253	4C.083	23.091	*	-24.311	17.250	12.739	
	1740.C	21.27	*	10.438	6.098	67.855	*	29.943	4.605	132.760	C.834	2.156	4C.095	18.318	*	-33.358	15.089	10.936	
	1750.C	19.86	*	10.425	6.028	67.099	*	29.856	4.712	142.620	C.827	2.054	4C.111	13.639	*	-44.238	13.202	9.430	
	1760.C	18.70	*	10.416	5.978	66.582	*	29.769	4.785	152.480	C.821	1.948	4C.120	9.048	*	-57.360	11.698	8.289	
	1770.C	17.98	*	10.411	5.947	66.313	*	29.671	4.826	162.340	C.818	1.838	4C.125	4.536	*	-72.766	10.710	7.573	
	1780.C	17.73	*	10.408	5.932	66.324	*	29.521	4.834	172.200	C.817	1.726	4C.126	0.095	*	-89.632	10.356	7.324	
	1790.C	17.55	*	10.408	5.932	66.617	*	29.303	4.810	182.060	C.818	C.554	4C.123	-4.285	*	253.681	10.670	7.545	
	1800.C	18.61	*	10.411	5.946	67.193	*	28.999	4.754	191.920	C.820	C.575	4C.116	-8.618	*	238.715	11.576	8.199	
	1810.C	19.64	*	10.416	5.974	68.044	*	28.593	4.667	201.780	C.825	C.545	4C.106	-12.518	*	226.111	12.933	9.222	
ECATE	TTIME	DV	SLM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	CV1

TABLE XII. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 SATURN RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	CV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1	
170C 18E	1770.C	22.85	*	10.436	6.087	70.906	*	27.126	4.367	125.220	0.842	2.252	40.072	22.299	* -25.662	16.869	12.416
	1780.C	21.08	*	10.419	5.994	70.000	*	27.096	4.501	135.080	0.832	2.153	40.087	17.558	* -34.940	14.752	10.663
	1790.C	19.62	*	10.407	5.924	69.293	*	27.077	4.602	144.940	0.824	2.045	40.098	12.907	* -46.123	12.923	9.214
	1800.C	18.54	*	10.359	5.876	68.813	*	27.038	4.671	154.800	0.819	1.941	40.106	8.340	* -59.593	11.493	8.138
	1810.C	17.85	*	10.394	5.847	68.601	*	26.951	4.707	164.660	0.816	1.830	40.110	3.847	* -75.287	10.597	7.494
	1820.C	17.71	*	10.352	5.834	68.650	*	26.795	4.711	174.520	0.815	1.000	40.111	-0.579	* 267.756	10.347	7.318
	1830.C	18.00	*	10.352	5.835	68.987	*	26.554	4.683	184.380	0.817	0.552	40.108	-4.951	* 251.235	10.760	7.609
	1840.C	18.72	*	10.356	5.858	69.598	*	26.204	4.624	194.240	0.820	0.571	40.101	-9.281	* 236.594	11.746	8.324
1850.C	19.80	*	10.402	5.892	70.480	*	25.730	4.535	204.100	0.825	0.525	40.091	-13.583	* 224.335	13.163	9.400	
1860.C	21.18	*	10.410	5.944	71.616	*	25.116	4.416	213.960	0.832	0.896	40.077	-17.874	* 214.244	14.880	10.766	
1735 15C	1810.C	22.52	*	10.419	5.954	72.982	*	24.177	4.283	127.540	0.835	2.250	40.063	21.504	* -27.066	16.492	12.099
	1820.C	20.80	*	10.403	5.902	72.128	*	24.241	4.411	137.400	0.830	2.149	40.077	16.794	* -36.592	14.422	10.396
	1830.C	19.40	*	10.351	5.833	71.472	*	24.285	4.507	147.260	0.822	2.043	40.088	12.170	* -48.094	12.653	9.007
	1840.C	18.38	*	10.384	5.787	71.046	*	24.283	4.571	157.120	0.818	1.934	40.095	7.624	* -61.919	11.300	7.997
	1850.C	17.81	*	10.375	5.755	70.881	*	24.201	4.602	166.980	0.815	1.822	40.098	3.150	* -77.887	10.501	7.426
	1860.C	17.70	*	10.378	5.751	70.970	*	24.045	4.602	176.840	0.814	0.555	40.098	-1.265	* 265.097	10.356	7.325
	1870.C	18.00	*	10.375	5.756	71.347	*	23.764	4.571	186.700	0.816	0.585	40.095	-5.629	* 248.787	10.868	7.685
	1880.C	18.85	*	10.383	5.782	71.986	*	23.368	4.509	196.560	0.815	0.567	40.088	-9.958	* 234.488	11.934	8.464
1890.C	19.56	*	10.350	5.825	72.895	*	22.818	4.418	206.420	0.825	0.533	40.078	-14.264	* 222.574	13.409	9.592	
1900.C	21.40	*	10.400	5.884	74.049	*	22.103	4.297	216.280	0.832	0.888	40.065	-18.565	* 212.766	15.169	11.002	
1764 125	1830.C	23.38	*	10.421	6.003	74.836	*	22.217	4.153	123.446	0.843	2.303	40.045	23.688	* -23.227	17.509	12.960
	1840.C	21.54	*	10.402	5.897	73.924	*	22.346	4.295	133.306	0.833	2.204	40.064	18.947	* -31.983	15.337	11.139
	1850.C	19.95	*	10.385	5.816	73.186	*	22.453	4.405	143.166	0.825	2.100	40.076	14.292	* -42.500	13.419	9.600
	1860.C	18.75	*	10.379	5.759	72.658	*	22.510	4.484	153.026	0.819	1.992	40.085	9.717	* -55.213	11.859	8.408
	1870.C	18.00	*	10.373	5.722	72.370	*	22.493	4.530	162.886	0.815	1.880	40.090	5.216	* -70.257	10.788	7.629
	1880.C	17.66	*	10.370	5.705	72.348	*	22.373	4.545	172.746	0.814	1.766	40.092	0.778	* -86.978	10.332	7.308
	1890.C	17.63	*	10.370	5.706	72.583	*	22.156	4.529	182.606	0.814	0.556	40.090	-3.608	* 256.161	10.547	7.458
	1900.C	18.42	*	10.373	5.724	73.101	*	21.792	4.482	192.466	0.817	0.575	40.085	-7.952	* 240.817	11.373	8.050
1910.C	19.41	*	10.375	5.760	73.875	*	21.290	4.406	202.326	0.822	0.550	40.076	-12.271	* 227.791	12.678	9.026	
1920.C	20.70	*	10.388	5.814	74.905	*	20.613	4.301	212.186	0.828	0.510	40.065	-16.578	* 217.049	14.323	10.316	
1785 10C	1860.C	22.34	*	10.404	5.904	75.725	*	20.387	4.179	129.213	0.837	2.255	40.052	21.105	* -27.773	16.300	11.938
	1870.C	20.65	*	10.388	5.810	74.919	*	20.567	4.303	139.073	0.828	2.156	40.065	16.420	* -37.406	14.258	10.264
	1880.C	19.28	*	10.376	5.741	74.302	*	20.693	4.396	148.932	0.821	2.045	40.075	11.817	* -49.045	12.520	8.906
	1890.C	18.30	*	10.368	5.694	73.908	*	20.740	4.457	158.793	0.816	1.935	40.082	7.288	* -63.022	11.208	7.930
	1900.C	17.76	*	10.364	5.668	73.760	*	20.689	4.487	168.653	0.814	1.825	40.085	2.825	* -79.109	10.455	7.393
	1910.C	17.65	*	10.363	5.661	73.881	*	20.513	4.485	178.513	0.812	0.555	40.085	-1.581	* 263.870	10.359	7.326
	1920.C	18.08	*	10.364	5.672	74.257	*	20.216	4.454	188.373	0.815	0.588	40.082	-5.945	* 247.648	10.916	7.720
	1930.C	18.90	*	10.365	5.702	74.910	*	19.752	4.392	198.233	0.819	0.565	40.075	-10.276	* 233.503	12.019	8.527
1940.C	20.06	*	10.377	5.750	75.810	*	19.125	4.302	208.093	0.824	0.530	40.065	-14.551	* 221.732	13.525	9.683	
1950.C	21.51	*	10.389	5.817	76.949	*	18.298	4.184	217.953	0.822	0.884	40.052	-18.906	* 212.040	15.309	11.117	
1814 75	1860.C	23.15	*	10.407	5.923	77.522	*	18.359	4.063	125.120	0.842	2.313	40.040	23.268	* -23.912	17.302	12.784
	1890.C	21.38	*	10.388	5.815	76.654	*	18.633	4.201	134.980	0.831	2.212	40.054	18.553	* -32.766	15.156	10.991
	1900.C	19.86	*	10.375	5.733	75.969	*	18.827	4.307	144.840	0.823	2.106	40.066	13.922	* -43.409	13.269	9.483
	1910.C	18.65	*	10.365	5.675	75.478	*	18.948	4.383	154.700	0.818	1.997	40.074	5.365	* -56.277	11.746	8.324
	1920.C	17.94	*	10.359	5.639	75.219	*	18.965	4.427	164.560	0.814	1.884	40.079	4.877	* -71.466	10.719	7.580
	1930.C	17.65	*	10.356	5.624	75.212	*	18.861	4.440	174.420	0.813	1.768	40.080	0.448	* -88.260	10.313	7.295
	1940.C	17.84	*	10.357	5.627	75.474	*	18.609	4.423	184.280	0.813	0.555	40.078	-3.933	* 254.937	10.577	7.479
	1950.C	18.46	*	10.361	5.650	75.987	*	18.215	4.377	194.140	0.816	0.577	40.073	-8.280	* 239.725	11.446	8.104
1960.C	19.46	*	10.368	5.691	76.767	*	17.632	4.301	204.000	0.821	0.547	40.065	-12.604	* 226.861	12.785	9.108	
1970.C	20.60	*	10.378	5.752	77.781	*	16.859	4.198	213.860	0.828	0.506	40.054	-16.922	* 216.253	14.458	10.425	
ECATE	TTIME	CV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1	

ECATE	TIME	CV	SLM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	CV1
1E35 5C	1910.C	22.17	*	10.351	5.831	78.406	*	16.616	4.098	130.887	C.825	2.267	4C.044	20.693	*	-28.522	16.105	11.775	
	1920.C	20.51	*	10.375	5.736	77.649	*	16.908	4.218	140.747	C.826	2.162	4C.056	16.032	*	-38.272	14.091	10.131	
	1930.C	19.17	*	10.363	5.666	77.074	*	17.112	4.307	150.607	C.82C	2.054	4C.066	11.448	*	-50.063	12.388	8.805	
	1940.C	18.22	*	10.356	5.615	76.714	*	17.206	4.366	160.467	C.815	1.542	4C.072	6.934	*	-64.202	11.117	7.864	
	1950.C	17.72	*	10.352	5.594	76.592	*	17.174	4.393	170.327	C.813	1.827	4C.075	2.482	*	-80.406	10.413	7.364	
	1960.C	17.66	*	10.351	5.59C	76.724	*	16.998	4.391	180.187	C.812	C.555	4C.075	-1.919	*	262.564	10.369	7.334	
	1970.C	18.11	*	10.353	5.604	77.123	*	16.653	4.358	190.047	C.814	C.567	4C.071	-6.280	*	246.459	10.974	7.761	
	1980.C	18.96	*	10.359	5.635	77.766	*	16.143	4.298	199.907	C.816	C.562	4C.065	-10.616	*	232.471	12.116	8.600	
	1990.C	20.15	*	10.368	5.693	78.662	*	15.422	4.209	209.767	C.824	C.526	4C.055	-14.940	*	220.856	13.653	9.783	
	2000.C	21.62	*	10.380	5.766	79.788	*	14.470	4.093	219.627	C.822	C.88C	4C.043	-19.268	*	211.287	15.462	11.243	
1E44 25	1930.C	23.00	*	10.356	5.858	80.139	*	14.540	3.996	126.793	C.84C	2.221	4C.033	22.836	*	-24.633	17.094	12.607	
	1940.C	21.22	*	10.377	5.749	79.335	*	14.933	4.129	136.653	C.83C	2.219	4C.047	18.149	*	-33.590	14.974	10.843	
	1950.C	19.73	*	10.363	5.666	78.688	*	15.229	4.231	146.513	C.822	2.112	4C.057	13.537	*	-44.377	13.118	9.365	
	1960.C	18.55	*	10.354	5.608	78.236	*	15.409	4.303	156.373	C.816	2.001	4C.065	8.997	*	-57.413	11.634	8.241	
	1970.C	17.88	*	10.348	5.573	78.008	*	15.457	4.345	166.233	C.813	1.886	4C.07C	4.521	*	-72.754	10.654	7.533	
	1980.C	17.63	*	10.346	5.559	78.023	*	15.357	4.356	176.093	C.812	1.766	4C.071	0.100	*	-89.613	10.301	7.286	
	1990.C	17.85	*	10.347	5.566	78.291	*	15.091	4.339	185.953	C.813	C.554	4C.065	-4.279	*	253.645	10.617	7.507	
	2000.C	18.52	*	10.351	5.553	78.821	*	14.634	4.292	195.813	C.816	C.575	4C.064	-8.626	*	238.592	11.530	8.165	
	2010.C	19.56	*	10.359	5.640	79.585	*	13.990	4.217	205.673	C.821	C.944	4C.056	-12.958	*	225.891	12.905	9.200	
	2020.C	20.51	*	10.370	5.707	80.585	*	13.111	4.116	215.533	C.828	C.502	4C.045	-17.289	*	215.427	14.605	10.543	
1E85 C	1960.C	21.55	*	10.381	5.772	81.015	*	12.896	4.039	132.56C	C.824	2.274	4C.038	20.27C	*	-29.312	15.908	11.611	
	1970.C	20.36	*	10.365	5.677	80.311	*	13.295	4.155	142.420	C.825	2.165	4C.049	15.631	*	-39.191	13.923	9.997	
	1980.C	19.06	*	10.354	5.607	79.780	*	13.570	4.240	152.280	C.818	2.055	4C.058	11.065	*	-51.145	12.255	8.705	
	1990.C	18.15	*	10.346	5.56C	79.454	*	13.707	4.295	162.140	C.814	1.545	4C.064	6.565	*	-65.457	11.028	7.800	
	2000.C	17.66	*	10.342	5.537	79.358	*	13.690	4.320	172.00C	C.812	1.828	4C.067	2.122	*	-81.778	10.376	7.338	
	2010.C	17.65	*	10.342	5.534	79.507	*	13.503	4.316	181.860	C.812	C.558	4C.067	-2.274	*	261.197	10.387	7.346	
	2020.C	18.16	*	10.345	5.553	79.907	*	13.130	4.284	191.720	C.814	C.585	4C.063	-6.635	*	245.213	11.042	7.810	
	2030.C	19.03	*	10.351	5.592	80.561	*	12.542	4.223	201.580	C.816	C.56C	4C.057	-10.975	*	231.404	12.224	8.681	
	2040.C	20.26	*	10.361	5.653	81.435	*	11.745	4.136	211.440	C.824	C.523	4C.048	-15.310	*	219.948	13.793	9.894	
	2050.C	21.75	*	10.375	5.735	82.527	*	10.687	4.022	221.300	C.822	C.875	4C.036	-19.654	*	210.505	15.629	11.380	
1914 352	1960.C	22.82	*	10.387	5.806	82.681	*	10.794	3.950	128.467	C.835	2.325	4C.025	22.397	*	-25.391	16.883	12.428	
	1990.C	21.06	*	10.369	5.697	81.934	*	11.306	4.077	138.327	C.829	2.225	4C.042	17.731	*	-34.462	14.790	10.693	
	2000.C	19.60	*	10.355	5.614	81.336	*	11.687	4.175	148.187	C.821	2.116	4C.052	13.139	*	-45.403	12.967	9.248	
	2010.C	18.50	*	10.345	5.556	80.924	*	11.920	4.244	158.047	C.815	2.004	4C.059	8.614	*	-58.618	11.522	8.159	
	2020.C	17.83	*	10.34C	5.522	80.726	*	11.994	4.282	167.907	C.812	1.888	4C.063	4.15C	*	-74.116	10.592	7.490	
	2030.C	17.62	*	10.338	5.51C	80.762	*	11.894	4.292	177.767	C.811	1.000	4C.064	-0.265	*	268.967	10.295	7.282	
	2040.C	17.88	*	10.340	5.52C	81.041	*	11.604	4.273	187.627	C.812	C.552	4C.062	-4.642	*	252.302	10.665	7.541	
	2050.C	18.58	*	10.345	5.551	81.566	*	11.106	4.227	197.487	C.816	C.573	4C.057	-8.993	*	237.411	11.625	8.235	
	2060.C	19.65	*	10.353	5.604	82.334	*	10.369	4.153	207.347	C.821	C.541	4C.045	-13.331	*	224.894	13.035	9.301	
	2070.C	21.04	*	10.365	5.678	83.306	*	9.398	4.054	217.207	C.828	C.858	4C.035	-17.675	*	214.576	14.765	10.673	
1935 327	2010.C	21.82	*	10.374	5.727	83.547	*	9.260	4.000	134.233	C.832	2.281	4C.034	15.836	*	-30.143	15.709	11.446	
	2020.C	20.22	*	10.358	5.631	82.896	*	9.755	4.110	144.093	C.824	2.174	4C.045	15.218	*	-40.161	13.754	9.863	
	2030.C	18.55	*	10.346	5.561	82.399	*	10.108	4.191	152.952	C.817	2.062	4C.053	10.667	*	-52.295	12.123	8.605	
	2040.C	18.08	*	10.339	5.516	82.119	*	10.267	4.243	163.812	C.813	1.547	4C.059	6.181	*	-66.784	10.942	7.738	
	2050.C	17.65	*	10.335	5.494	82.049	*	10.261	4.266	172.672	C.811	1.828	4C.061	1.747	*	-83.221	10.345	7.317	
	2060.C	17.70	*	10.335	5.494	82.214	*	10.061	4.261	183.533	C.811	C.558	4C.061	-2.646	*	259.771	10.413	7.364	
	2070.C	18.21	*	10.339	5.517	82.619	*	9.650	4.228	193.393	C.814	C.582	4C.057	-7.008	*	243.925	11.119	7.866	
	2080.C	19.12	*	10.346	5.561	83.259	*	9.010	4.168	202.253	C.818	C.557	4C.051	-11.354	*	230.298	12.344	8.772	
	2090.C	20.37	*	10.357	5.627	84.131	*	8.103	4.082	212.113	C.825	C.515	4C.042	-15.698	*	219.016	13.944	10.014	
	2100.C	21.90	*	10.372	5.717	85.187	*	6.938	3.971	222.972	C.822	C.87C	4C.031	-20.059	*	209.703	15.807	11.527	
ECATE	TIME	CV	SLM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	DV1



TABLE XII. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

PARKING ORBIT TO 1.1 SATURN RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	CV	SUM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	DV1
				*				*								*			
				*				*								*			
				*				*								*			
1964	2030.C	22.63	*	10.380	5.768	85.143	*	7.151	3.923	130.140	C.837	2.336	4C.026	21.946	*	-26.183	16.670	12.248	
3C2	2040.C	20.91	*	10.362	5.658	84.453	*	7.771	4.045	140.000	C.827	2.230	4C.038	17.302	*	-35.381	14.605	10.543	
	2050.C	19.48	*	10.349	5.575	83.904	*	8.226	4.138	149.860	C.820	2.120	4C.048	12.728	*	-46.486	12.815	9.131	
	2060.C	18.42	*	10.339	5.518	83.538	*	8.500	4.202	159.720	C.815	2.006	4C.054	8.218	*	-59.889	11.413	8.079	
	2070.C	17.78	*	10.334	5.485	83.365	*	8.600	4.238	169.580	0.812	1.888	4C.058	3.763	*	-75.550	10.535	7.450	
	2080.C	17.62	*	10.332	5.476	83.421	*	8.497	4.246	179.440	C.811	1.000	4C.055	-0.647	*	267.483	10.296	7.283	
	2090.C	17.92	*	10.335	5.489	83.711	*	8.180	4.226	189.300	C.812	C.951	4C.057	-5.022	*	250.911	10.723	7.582	
	2100.C	18.65	*	10.340	5.524	84.233	*	7.631	4.180	199.160	C.816	C.970	4C.052	-9.377	*	236.198	11.730	8.312	
	2110.C	19.76	*	10.350	5.562	84.979	*	6.831	4.107	209.020	C.821	C.938	4C.045	-13.725	*	223.863	13.177	9.411	
	2120.C	21.17	*	10.363	5.664	85.931	*	5.752	4.010	218.880	C.825	C.854	4C.035	-18.082	*	213.701	14.936	10.812	
			*				*								*				
1989	2050.C	23.46	*	10.389	5.818	86.713	*	4.977	3.845	126.047	C.842	2.390	4C.015	24.062	*	-22.538	17.666	13.094	
277	2060.C	21.65	*	10.368	5.654	85.997	*	5.734	3.979	135.907	C.832	2.286	4C.032	19.392	*	-31.013	15.508	11.281	
	2070.C	20.08	*	10.352	5.558	85.400	*	6.313	4.083	145.767	C.823	2.178	4C.042	14.793	*	-41.183	13.584	9.730	
	2080.C	18.85	*	10.341	5.525	84.958	*	6.708	4.160	155.627	C.817	2.065	4C.050	10.259	*	-53.500	11.992	8.507	
	2090.C	18.01	*	10.334	5.485	84.703	*	6.910	4.208	165.487	C.812	1.948	4C.055	5.783	*	-68.181	10.859	7.679	
	2100.C	17.62	*	10.331	5.465	84.658	*	6.909	4.229	175.347	C.811	1.828	4C.057	1.356	*	-84.731	10.320	7.299	
	2110.C	17.72	*	10.331	5.468	84.837	*	6.692	4.222	185.207	C.811	C.957	4C.057	-3.034	*	258.292	10.448	7.388	
	2120.C	18.26	*	10.335	5.454	85.245	*	6.242	4.189	195.067	C.814	C.962	4C.053	-7.398	*	242.599	11.207	7.929	
	2130.C	19.21	*	10.343	5.543	85.876	*	5.539	4.130	204.927	C.818	C.954	4C.047	-11.751	*	229.166	12.473	8.870	
	2140.C	20.50	*	10.355	5.616	86.716	*	4.560	4.045	214.787	C.825	C.915	4C.038	-16.107	*	218.057	14.107	10.144	
			*				*								*				
2014	2080.C	22.44	*	10.376	5.740	87.521	*	3.638	3.912	131.814	C.826	2.342	4C.025	21.486	*	-27.011	16.455	12.068	
252	2090.C	20.75	*	10.358	5.631	86.888	*	4.351	4.028	141.674	C.826	2.235	4C.037	16.862	*	-36.345	14.419	10.393	
	2100.C	19.36	*	10.344	5.548	86.389	*	4.870	4.117	151.534	C.815	2.123	4C.046	12.305	*	-47.627	12.663	9.015	
	2110.C	18.34	*	10.325	5.452	86.057	*	5.188	4.177	161.394	C.814	2.007	4C.052	7.808	*	-61.232	11.306	8.001	
	2120.C	17.74	*	10.330	5.461	85.920	*	5.296	4.210	171.254	C.811	1.888	4C.055	3.362	*	-77.052	10.483	7.413	
	2130.C	17.62	*	10.325	5.454	85.995	*	5.184	4.216	181.114	C.810	1.000	4C.056	-1.043	*	265.941	10.305	7.289	
	2140.C	17.96	*	10.322	5.470	86.292	*	4.838	4.195	190.974	C.812	C.950	4C.054	-5.419	*	249.477	10.789	7.629	
	2150.C	18.74	*	10.338	5.510	86.810	*	4.238	4.149	200.834	0.816	C.968	4C.049	-9.778	*	234.954	11.844	8.397	
	2160.C	19.88	*	10.348	5.574	87.539	*	3.364	4.078	210.694	C.822	C.934	4C.042	-14.135	*	222.812	13.330	9.530	
	2170.C	21.32	*	10.363	5.661	88.460	*	2.189	3.983	220.554	C.820	C.885	4C.032	-18.507	*	212.808	15.118	10.961	
			*				*								*				
2035	2100.C	23.28	*	10.385	5.755	89.017	*	1.482	3.846	127.720	C.841	2.357	4C.015	23.586	*	-23.328	17.438	12.900	
227	2110.C	21.48	*	10.364	5.672	88.362	*	2.339	3.973	137.580	C.830	2.291	4C.031	18.937	*	-31.924	15.307	11.115	
	2120.C	19.54	*	10.345	5.576	87.818	*	2.989	4.072	147.440	C.822	2.181	4C.041	14.357	*	-42.257	13.414	9.596	
	2130.C	18.75	*	10.338	5.508	87.420	*	3.430	4.144	157.300	C.816	2.066	4C.048	9.837	*	-54.772	11.862	8.410	
	2140.C	17.95	*	10.331	5.465	87.200	*	3.654	4.189	167.160	C.812	1.948	4C.052	5.372	*	-69.646	10.780	7.623	
	2150.C	17.61	*	10.328	5.447	87.179	*	3.654	4.207	177.020	C.810	1.828	4C.055	C.950	*	-86.302	10.301	7.286	
	2160.C	17.75	*	10.325	5.453	87.370	*	3.416	4.199	186.880	C.811	C.956	4C.054	-3.438	*	256.765	10.491	7.418	
	2170.C	18.33	*	10.324	5.483	87.779	*	2.925	4.165	196.740	C.814	C.975	4C.051	-7.805	*	241.240	11.304	8.000	
	2180.C	19.32	*	10.342	5.537	88.398	*	2.161	4.107	206.600	C.815	C.951	4C.044	-12.165	*	228.010	12.614	8.977	
	2190.C	20.64	*	10.355	5.616	89.213	*	1.098	4.024	216.460	C.826	C.910	4C.036	-16.533	*	217.081	14.281	10.283	
			*				*								*				
ECATE	TTIME	CV	SUM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	DV1

ECATE	TIME	CV SUM *	OV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMIC	VEL1	ALPHA1 *	PHI1	VINF1	DV1
2078	2140.C	22.54 *	10.381	5.770	90.687 *	-1.024	3.870	130.040	0.835	2.350	40.021	22.730 *	-24.793	17.033	12.556
186	2150.C	21.18 *	10.361	5.650	90.141 *	-0.200	3.989	139.900	0.825	2.284	40.033	18.111 *	-33.635	14.947	10.821
	2160.C	19.70 *	10.346	5.558	89.596 *	0.550	4.081	149.760	0.821	2.171	40.042	13.542 *	-44.326	13.107	9.357
	2170.C	18.57 *	10.335	5.493	89.248 *	0.995	4.147	159.620	0.815	2.055	40.049	9.035 *	-57.248	11.630	8.239
	2180.C	17.86 *	10.325	5.454	89.073 *	1.208	4.186	169.480	0.811	1.935	40.053	4.585 *	-72.498	10.647	7.529
	2190.C	17.60 *	10.327	5.441	89.090 *	1.178	4.200	179.340	0.810	1.812	40.054	0.172 *	-89.331	10.285	7.275
	2200.C	17.82 *	10.329	5.452	89.312 *	0.896	4.188	189.200	0.811	0.954	40.053	-4.213 *	253.871	10.592	7.489
	2210.C	18.48 *	10.334	5.488	89.740 *	0.343	4.152	199.060	0.814	0.975	40.049	-8.582 *	238.704	11.505	8.146
	2220.C	19.53 *	10.344	5.548	90.368 *	-0.499	4.091	208.920	0.820	0.944	40.043	-12.949 *	225.886	12.890	9.189
	2230.C	20.51 *	10.358	5.634	91.179 *	-1.658	4.008	218.780	0.827	0.902	40.035	-17.329 *	215.313	14.614	10.550
		*			*							*			
2117	2180.C	22.60 *	10.377	5.750	92.314 *	-3.411	3.901	132.260	0.837	2.283	40.024	21.873 *	-26.310	16.634	12.218
150	2190.C	20.89 *	10.358	5.634	91.767 *	-2.482	4.012	142.220	0.827	2.274	40.035	17.268 *	-35.447	14.588	10.530
	2200.C	19.47 *	10.344	5.546	91.328 *	-1.798	4.097	152.080	0.820	2.161	40.043	12.725 *	-46.484	12.810	9.128
	2210.C	18.41 *	10.334	5.485	91.029 *	-1.358	4.156	161.940	0.814	2.043	40.050	8.236 *	-59.822	11.413	8.079
	2220.C	17.78 *	10.328	5.450	90.896 *	-1.165	4.191	171.800	0.811	1.921	40.053	3.793 *	-75.431	10.534	7.449
	2230.C	17.61 *	10.327	5.441	90.949 *	-1.229	4.200	181.660	0.810	1.800	40.054	-0.614 *	267.610	10.291	7.279
	2240.C	17.91 *	10.330	5.457	91.197 *	-1.562	4.184	191.520	0.812	0.952	40.053	-4.997 *	250.997	10.714	7.576
	2250.C	18.64 *	10.336	5.499	91.642 *	-2.178	4.145	201.380	0.815	0.970	40.048	-5.369 *	236.215	11.724	8.308
	2260.C	19.76 *	10.347	5.566	92.275 *	-3.101	4.084	211.240	0.821	0.927	40.042	-13.744 *	223.808	13.183	9.415
	2270.C	21.15 *	10.362	5.655	93.078 *	-4.357	4.000	221.100	0.825	0.853	40.034	-18.138 *	213.581	14.960	10.831
		*			*							*			
2142	2200.C	23.44 *	10.385	5.817	93.657 *	-5.527	3.852	128.266	0.842	2.438	40.015	23.950 *	-22.724	17.612	13.049
125	2210.C	21.62 *	10.367	5.687	93.102 *	-4.443	3.972	138.126	0.831	2.331	40.031	19.323 *	-31.150	15.477	11.255
	2220.C	20.07 *	10.350	5.586	92.630 *	-3.614	4.067	147.986	0.823	2.215	40.040	14.758 *	-41.265	13.569	9.718
	2230.C	18.84 *	10.338	5.512	92.280 *	-3.038	4.137	157.846	0.816	2.102	40.048	10.249 *	-53.525	11.986	8.503
	2240.C	18.01 *	10.331	5.465	92.078 *	-2.716	4.182	167.706	0.812	1.982	40.052	5.789 *	-68.157	10.857	7.678
	2250.C	17.62 *	10.327	5.445	92.048 *	-2.653	4.202	177.566	0.810	1.858	40.054	1.368 *	-84.684	10.317	7.297
	2260.C	17.71 *	10.328	5.450	92.206 *	-2.865	4.198	187.426	0.811	0.957	40.054	-3.025 *	258.323	10.444	7.386
	2270.C	18.26 *	10.333	5.481	92.550 *	-3.352	4.171	197.286	0.813	0.981	40.051	-7.403 *	242.580	11.206	7.929
	2280.C	19.22 *	10.342	5.537	93.084 *	-4.146	4.121	207.146	0.818	0.954	40.046	-11.779 *	229.087	12.482	8.876
	2290.C	20.52 *	10.356	5.620	93.791 *	-5.266	4.049	217.006	0.825	0.914	40.035	-16.167 *	217.920	14.132	10.164
		*			*							*			
2167	2230.C	22.41 *	10.377	5.745	94.404 *	-6.445	3.932	134.033	0.836	2.387	40.027	21.381 *	-27.208	16.408	12.029
100	2240.C	20.73 *	10.358	5.634	93.917 *	-5.470	4.037	143.893	0.826	2.277	40.037	16.795 *	-36.497	14.391	10.371
	2250.C	19.35 *	10.344	5.547	93.525 *	-4.753	4.116	153.753	0.815	2.161	40.045	12.266 *	-47.735	12.650	9.004
	2260.C	18.33 *	10.334	5.488	93.265 *	-4.296	4.172	163.613	0.814	2.042	40.051	7.788 *	-61.297	11.300	7.997
	2270.C	17.74 *	10.325	5.455	93.160 *	-4.104	4.203	173.473	0.811	1.915	40.054	3.352 *	-77.089	10.481	7.412
	2280.C	17.62 *	10.328	5.445	93.230 *	-4.183	4.210	183.333	0.810	1.800	40.055	-1.053 *	265.904	10.305	7.289
	2290.C	17.56 *	10.331	5.465	93.484 *	-4.546	4.193	193.193	0.812	0.950	40.053	-5.437 *	249.411	10.792	7.632
	2300.C	18.74 *	10.339	5.515	93.921 *	-5.209	4.154	203.052	0.816	0.968	40.045	-9.815 *	234.842	11.856	8.406
	2310.C	19.90 *	10.350	5.587	94.533 *	-6.193	4.094	212.913	0.822	0.933	40.043	-14.200 *	222.652	13.356	9.551
	2320.C	21.27 *	10.367	5.686	95.302 *	-7.524	4.012	222.773	0.830	0.888	40.035	-18.609 *	212.604	15.166	10.999
		*			*							*			
2192	2250.C	23.23 *	10.385	5.818	95.681 *	-8.509	3.892	129.940	0.841	2.443	40.023	23.445 *	-23.574	17.374	12.845
75	2260.C	21.45 *	10.367	5.690	95.172 *	-7.357	4.005	139.800	0.830	2.334	40.034	18.836 *	-32.139	15.264	11.080
	2270.C	19.93 *	10.351	5.590	94.759 *	-6.504	4.094	149.660	0.822	2.220	40.043	14.287 *	-42.435	13.390	9.577
	2280.C	18.74 *	10.339	5.518	94.451 *	-5.909	4.160	159.520	0.816	2.102	40.050	9.791 *	-54.917	11.849	8.401
	2290.C	17.95 *	10.332	5.473	94.282 *	-5.583	4.201	169.380	0.812	1.980	40.054	5.339 *	-69.766	10.775	7.620
	2300.C	17.62 *	10.329	5.455	94.274 *	-5.531	4.218	179.240	0.810	1.854	40.056	0.922 *	-86.413	10.301	7.286
	2310.C	17.75 *	10.331	5.464	94.440 *	-5.763	4.213	189.100	0.811	0.956	40.056	-3.471 *	256.641	10.496	7.422
	2320.C	18.35 *	10.336	5.499	94.785 *	-6.293	4.185	198.960	0.814	0.975	40.053	-7.852 *	241.086	11.318	8.010
	2330.C	19.34 *	10.346	5.560	95.303 *	-7.139	4.135	208.820	0.815	0.950	40.047	-12.236 *	227.820	12.641	8.998
	2340.C	20.68 *	10.360	5.648	95.982 *	-8.326	4.065	218.680	0.826	0.905	40.040	-16.638 *	216.855	14.328	10.320
		*			*							*			
ECATE	TIME	CV SUM *	OV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMIC	VEL1	ALPHA1 *	PHI1	VINF1	DV1

TABLE XII. - Concluded. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 SATURN RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	CV	SUM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	DV1
2217 5C	2280.C	22.22	*	10.378	5.754	96.417	*	-9.314	3.973	135.706	0.835	2.391	4C.031	20.884	*	-28.137	16.182	11.840	
	2290.C	20.57	*	10.359	5.641	95.977	*	-8.295	4.071	145.566	0.826	2.278	4C.041	16.313	*	-37.592	14.194	10.213	
	2300.C	19.23	*	10.345	5.556	95.630	*	-7.556	4.146	155.426	0.819	2.161	4C.049	11.798	*	-49.040	12.491	8.883	
	2310.C	18.25	*	10.336	5.495	95.407	*	-7.092	4.197	165.286	0.814	2.040	4C.054	7.329	*	-62.834	11.191	7.918	
	2320.C	17.71	*	10.331	5.465	95.329	*	-6.906	4.225	175.146	0.811	1.915	4C.057	2.899	*	-78.806	10.434	7.379	
	2330.C	17.64	*	10.331	5.465	95.415	*	-7.004	4.230	185.007	0.811	1.955	4C.057	-1.504	*	264.157	10.327	7.304	
	2340.C	18.02	*	10.335	5.489	95.672	*	-7.399	4.212	194.866	0.813	1.988	4C.055	-5.891	*	247.801	10.880	7.694	
	2350.C	18.85	*	10.343	5.539	96.100	*	-8.108	4.173	204.727	0.817	1.965	4C.051	-10.275	*	233.456	11.998	8.511	
	2360.C	20.05	*	10.355	5.616	96.689	*	-9.150	4.114	214.586	0.823	1.925	4C.045	-14.671	*	221.488	13.540	9.694	
	2370.C	21.55	*	10.373	5.721	97.421	*	-10.553	4.035	224.447	0.831	1.882	4C.037	-19.096	*	211.618	15.382	11.176	
2242 25	2300.C	23.02	*	10.350	5.826	97.620	*	-11.305	3.941	131.613	0.840	2.446	4C.026	22.935	*	-24.454	17.135	12.642	
	2310.C	21.28	*	10.369	5.699	97.172	*	-10.126	4.047	141.473	0.830	2.336	4C.038	18.344	*	-33.162	15.052	10.907	
	2320.C	19.75	*	10.353	5.601	96.799	*	-9.238	4.131	151.333	0.822	2.220	4C.047	13.809	*	-43.654	13.211	9.437	
	2330.C	18.64	*	10.341	5.531	96.530	*	-8.632	4.191	161.193	0.816	2.101	4C.053	9.323	*	-56.368	11.715	8.301	
	2340.C	17.90	*	10.335	5.489	96.392	*	-8.309	4.229	171.053	0.812	1.977	4C.057	4.878	*	-71.435	10.699	7.565	
	2350.C	17.61	*	10.332	5.474	96.404	*	-8.272	4.244	180.913	0.811	1.850	4C.059	0.465	*	-88.192	10.292	7.280	
	2360.C	17.80	*	10.334	5.466	96.579	*	-8.531	4.236	190.773	0.812	1.955	4C.058	-3.925	*	254.930	10.557	7.465	
	2370.C	18.44	*	10.340	5.524	96.920	*	-9.100	4.208	200.633	0.815	1.977	4C.055	-8.315	*	239.576	11.439	8.098	
	2380.C	19.48	*	10.351	5.590	97.421	*	-9.998	4.159	210.493	0.820	1.946	4C.050	-12.708	*	226.544	12.810	9.127	
	2390.C	20.85	*	10.366	5.683	98.069	*	-11.247	4.090	220.352	0.827	1.904	4C.043	-17.124	*	215.782	14.533	10.486	
2267 C	2330.C	22.03	*	10.380	5.765	98.334	*	-11.990	4.022	131.380	0.834	2.393	4C.036	20.378	*	-29.103	15.955	11.650	
	2340.C	20.42	*	10.361	5.654	97.946	*	-10.953	4.114	141.240	0.825	2.279	4C.045	15.823	*	-38.731	13.997	10.056	
	2350.C	19.11	*	10.348	5.571	97.646	*	-10.206	4.183	151.100	0.818	2.161	4C.052	11.320	*	-50.399	12.334	8.764	
	2360.C	18.16	*	10.339	5.516	97.456	*	-9.743	4.230	166.960	0.814	2.038	4C.057	6.860	*	-64.431	11.086	7.842	
	2370.C	17.65	*	10.335	5.489	97.404	*	-9.568	4.255	176.820	0.811	1.912	4C.060	2.435	*	-80.577	10.394	7.351	
	2380.C	17.66	*	10.335	5.489	97.503	*	-9.690	4.258	186.680	0.811	1.955	4C.060	-1.967	*	262.372	10.358	7.326	
	2390.C	18.10	*	10.339	5.516	97.761	*	-10.119	4.240	196.540	0.812	1.988	4C.058	-6.357	*	246.171	10.978	7.764	
	2400.C	18.97	*	10.348	5.570	98.175	*	-10.868	4.201	206.400	0.816	1.961	4C.054	-10.749	*	232.058	12.149	8.625	
	2410.C	20.21	*	10.361	5.652	98.742	*	-11.969	4.142	216.260	0.824	1.924	4C.048	-15.157	*	220.316	13.733	9.846	
	2420.C	21.74	*	10.380	5.763	99.437	*	-13.438	4.066	226.120	0.833	1.876	4C.040	-19.597	*	210.626	15.607	11.362	
2292 352	2350.C	22.83	*	10.352	5.839	99.476	*	-13.916	3.997	132.287	0.835	2.445	4C.033	22.418	*	-25.364	16.896	12.439	
	2360.C	21.11	*	10.371	5.715	99.077	*	-12.713	4.096	143.147	0.829	2.331	4C.043	17.843	*	-34.228	14.840	10.734	
	2370.C	19.65	*	10.356	5.618	98.742	*	-11.805	4.174	153.007	0.821	2.220	4C.051	13.320	*	-44.926	13.033	9.299	
	2380.C	18.55	*	10.345	5.551	98.518	*	-11.208	4.230	162.867	0.816	2.099	4C.057	8.845	*	-57.878	11.584	8.205	
	2390.C	17.85	*	10.338	5.511	98.405	*	-10.894	4.264	172.727	0.812	1.973	4C.061	4.407	*	-73.163	10.628	7.515	
	2400.C	17.62	*	10.336	5.499	98.439	*	-10.876	4.277	182.587	0.811	1.900	4C.062	-0.004	*	270.000	10.292	7.280	
	2410.C	17.85	*	10.339	5.514	98.621	*	-11.165	4.268	192.447	0.812	1.953	4C.061	-4.395	*	253.194	10.627	7.515	
	2420.C	18.54	*	10.345	5.557	98.956	*	-11.773	4.239	202.307	0.816	1.974	4C.058	-8.791	*	238.054	11.570	8.194	
	2430.C	19.62	*	10.357	5.627	99.448	*	-12.732	4.191	212.167	0.821	1.942	4C.053	-13.192	*	225.265	12.988	9.264	
	2440.C	21.03	*	10.373	5.726	100.055	*	-14.028	4.124	222.027	0.829	1.899	4C.046	-17.623	*	214.704	14.748	10.659	
2317 327	2370.C	23.67	*	10.406	5.920	100.573	*	-15.873	3.971	129.193	0.844	2.505	4C.031	24.462	*	-21.911	17.867	13.267	
	2380.C	21.85	*	10.383	5.782	100.181	*	-14.514	4.078	139.053	0.833	2.395	4C.042	19.867	*	-30.100	15.729	11.463	
	2390.C	20.27	*	10.365	5.673	99.837	*	-13.460	4.164	148.913	0.825	2.279	4C.050	15.327	*	-39.914	13.802	9.901	
	2400.C	19.00	*	10.351	5.592	99.573	*	-12.707	4.228	158.773	0.818	2.155	4C.057	10.834	*	-51.814	12.179	8.648	
	2410.C	18.11	*	10.343	5.540	99.415	*	-12.250	4.271	168.633	0.814	2.035	4C.062	6.382	*	-66.088	10.986	7.770	
	2420.C	17.67	*	10.339	5.515	99.384	*	-12.092	4.293	178.493	0.811	1.907	4C.064	1.960	*	-82.399	10.362	7.328	
	2430.C	17.65	*	10.339	5.518	99.495	*	-12.240	4.294	188.353	0.812	1.958	4C.064	-2.441	*	260.555	10.399	7.354	
	2440.C	18.15	*	10.344	5.549	99.753	*	-12.703	4.275	198.213	0.814	1.984	4C.062	-6.835	*	244.526	11.085	7.841	
	2450.C	19.10	*	10.354	5.608	100.157	*	-13.500	4.236	208.073	0.819	1.958	4C.058	-11.234	*	230.657	12.310	8.746	
	2460.C	20.37	*	10.368	5.695	100.696	*	-14.650	4.179	217.933	0.825	1.915	4C.052	-15.655	*	219.141	13.935	10.007	

ELATE	TIME	CV	SUM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	DV1
				*				*								*			
2342 302	2400.C	22.63	*	10.356	5.857	101.250	*	-16.350	4.059	134.960	0.828	2.451	40.040	21.896	*	-26.305	16.656	12.237	
	2410.C	20.94	*	10.375	5.735	100.902	*	-15.142	4.152	144.820	0.828	2.338	40.049	17.336	*	-35.332	14.628	10.562	
	2420.C	19.52	*	10.355	5.641	100.614	*	-14.239	4.224	154.680	0.821	2.215	40.057	12.826	*	-46.243	12.858	9.164	
	2430.C	18.46	*	10.345	5.576	100.418	*	-13.638	4.276	164.540	0.815	2.096	40.062	8.355	*	-59.446	11.457	8.112	
	2440.C	17.81	*	10.343	5.538	100.334	*	-13.339	4.307	174.400	0.812	1.965	40.065	3.926	*	-74.947	10.564	7.470	
	2450.C	17.63	*	10.341	5.525	100.381	*	-13.344	4.317	184.260	0.811	1.000	40.067	-0.483	*	268.122	10.301	7.286	
	2460.C	17.92	*	10.344	5.548	100.567	*	-13.664	4.307	194.120	0.812	0.952	40.066	-4.880	*	251.438	10.707	7.571	
	2470.C	18.65	*	10.352	5.595	100.894	*	-14.312	4.278	203.980	0.816	0.571	40.062	-9.278	*	236.525	11.711	8.298	
	2480.C	19.77	*	10.364	5.670	101.357	*	-15.305	4.230	213.840	0.822	0.536	40.057	-13.692	*	223.977	13.176	9.410	
	2490.C	21.22	*	10.381	5.774	101.942	*	-16.669	4.165	223.700	0.830	0.893	40.051	-18.137	*	213.624	14.972	10.841	
			*				*								*				
2367 277	2420.C	23.46	*	10.410	5.538	102.282	*	-18.224	4.039	130.867	0.843	2.507	40.038	23.928	*	-22.801	17.615	13.051	
	2430.C	21.66	*	10.386	5.803	101.940	*	-16.861	4.139	140.727	0.823	2.396	40.048	19.350	*	-31.135	15.502	11.276	
	2440.C	20.12	*	10.368	5.696	101.634	*	-15.800	4.219	150.587	0.824	2.278	40.056	14.822	*	-41.145	13.607	9.748	
	2450.C	18.85	*	10.356	5.618	101.409	*	-15.055	4.279	160.447	0.818	2.157	40.062	10.340	*	-53.286	12.028	8.534	
	2460.C	18.05	*	10.347	5.568	101.285	*	-14.617	4.318	170.307	0.814	2.031	40.067	5.894	*	-67.804	10.892	7.703	
	2470.C	17.66	*	10.344	5.547	101.274	*	-14.480	4.337	180.167	0.812	1.901	40.065	1.476	*	-84.269	10.337	7.311	
	2480.C	17.73	*	10.345	5.553	101.394	*	-14.655	4.336	190.027	0.812	0.957	40.065	-2.926	*	258.711	10.448	7.389	
	2490.C	18.28	*	10.351	5.588	101.650	*	-15.155	4.316	199.887	0.815	0.962	40.067	-7.324	*	242.871	11.202	7.926	
	2500.C	19.24	*	10.361	5.651	102.039	*	-15.994	4.278	209.747	0.820	0.954	40.062	-11.733	*	229.251	12.481	8.876	
	2510.C	20.55	*	10.376	5.743	102.552	*	-17.194	4.222	219.607	0.827	0.914	40.056	-16.167	*	217.963	14.146	10.175	
			*				*								*				
2352 252	2450.C	22.43	*	10.355	5.875	102.946	*	-18.616	4.126	136.634	0.837	2.453	40.046	21.367	*	-27.278	16.416	12.036	
	2460.C	20.77	*	10.379	5.759	102.643	*	-17.412	4.213	146.494	0.828	2.337	40.055	16.823	*	-36.479	14.417	10.392	
	2470.C	19.35	*	10.364	5.668	102.395	*	-16.515	4.280	156.354	0.821	2.217	40.063	12.324	*	-47.615	12.685	9.031	
	2480.C	18.38	*	10.353	5.605	102.222	*	-15.917	4.327	166.214	0.815	2.092	40.068	7.864	*	-61.076	11.335	8.022	
	2490.C	17.78	*	10.348	5.571	102.171	*	-15.648	4.355	176.074	0.812	1.964	40.071	3.436	*	-76.785	10.507	7.430	
	2500.C	17.64	*	10.347	5.565	102.231	*	-15.679	4.363	185.934	0.812	1.000	40.072	-0.972	*	266.222	10.318	7.298	
	2510.C	17.55	*	10.351	5.587	102.420	*	-16.031	4.352	195.794	0.814	0.950	40.070	-5.372	*	245.667	10.797	7.635	
	2520.C	18.77	*	10.359	5.638	102.739	*	-16.718	4.322	205.654	0.817	0.968	40.067	-9.778	*	234.993	11.861	8.409	
	2530.C	19.54	*	10.372	5.718	103.181	*	-17.757	4.275	215.514	0.824	0.933	40.062	-14.203	*	222.691	13.373	9.564	
	2540.C	21.42	*	10.390	5.827	103.732	*	-19.172	4.212	225.374	0.832	0.887	40.055	-18.663	*	212.542	15.205	11.031	
			*				*								*				
2417 227	2470.C	23.25	*	10.413	5.561	103.924	*	-20.419	4.111	132.540	0.842	2.505	40.045	23.390	*	-23.717	17.364	12.837	
	2480.C	21.48	*	10.391	5.828	103.620	*	-19.051	4.205	142.400	0.832	2.396	40.055	18.826	*	-32.206	15.276	11.090	
	2490.C	19.97	*	10.373	5.724	103.362	*	-18.008	4.279	152.260	0.824	2.277	40.063	14.311	*	-42.420	13.415	9.597	
	2500.C	18.78	*	10.361	5.645	103.170	*	-17.273	4.334	162.120	0.818	2.154	40.068	9.838	*	-54.811	11.880	8.424	
	2510.C	17.95	*	10.353	5.602	103.068	*	-16.848	4.370	171.980	0.814	2.026	40.072	5.398	*	-69.577	10.804	7.640	
	2520.C	17.65	*	10.350	5.583	103.075	*	-16.735	4.386	181.840	0.812	1.895	40.074	0.982	*	-86.184	10.321	7.300	
	2530.C	17.78	*	10.351	5.593	103.202	*	-16.941	4.384	191.700	0.813	0.956	40.074	-3.421	*	256.845	10.508	7.431	
	2540.C	18.38	*	10.358	5.632	103.454	*	-17.477	4.363	201.560	0.816	0.975	40.072	-7.825	*	241.210	11.329	8.018	
	2550.C	19.38	*	10.365	5.699	103.828	*	-18.358	4.325	211.420	0.821	0.950	40.067	-12.243	*	227.846	12.661	9.013	
	2560.C	20.74	*	10.385	5.796	104.313	*	-19.605	4.270	221.280	0.828	0.955	40.062	-16.691	*	216.787	14.367	10.352	
			*				*								*				
ELATE	TIME	CV	SUM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	DV1

TABLE XIII. - TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

PARKING ORBIT TO 1.1 URANUS RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	CV SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1
554 184	610.C	78.34 *	40.638	51.345	4.373 *	86.807	51.275	61.460	3.270	1.774	65.645	33.426 *	-34.676	43.971	37.706
	620.C	74.30 *	40.175	50.845	4.156 *	86.517	50.805	71.320	3.475	1.697	65.279	24.914 *	-46.946	40.281	34.128
	630.C	71.05 *	39.747	50.381	4.015 *	86.307	50.362	81.180	3.612	1.612	64.934	16.623 *	-60.211	37.391	31.342
	640.C	68.81 *	39.335	49.935	3.951 *	86.176	49.932	91.040	3.670	1.520	64.601	8.580 *	-74.221	35.443	29.473
	650.C	67.51 *	38.935	49.505	3.963 *	86.119	49.500	100.900	3.660	1.421	64.268	0.815 *	-88.482	34.503	28.574
	660.C	67.13 *	38.534	49.066	4.045 *	86.131	49.055	110.760	3.585	1.351	63.926	-6.640 *	257.638	34.528	28.597
	670.C	67.51 *	38.116	48.610	4.191 *	86.201	48.587	120.620	3.465	1.262	63.567	-13.752 *	244.705	35.366	29.398
	680.C	68.45 *	37.675	48.125	4.392 *	86.321	48.087	130.480	3.302	1.155	63.186	-20.484 *	233.073	36.803	30.777
	690.C	69.72 *	37.207	47.615	4.638 *	86.478	47.552	140.340	3.110	1.062	62.780	-26.803 *	222.855	38.617	32.522
	700.C	71.15 *	36.706	47.071	4.918 *	86.661	46.978	150.200	2.901	1.079	62.346	-32.679 *	214.001	40.605	34.442
585 150	650.C	71.56 *	37.741	48.201	4.636 *	86.575	48.129	67.035	3.101	1.746	63.218	25.249 *	-39.418	39.983	33.841
	660.C	68.04 *	37.359	47.785	4.451 *	86.321	47.739	76.899	3.258	1.665	62.922	20.957 *	-52.177	36.699	30.677
	670.C	65.36 *	37.003	47.356	4.342 *	86.147	47.367	86.759	3.348	1.576	62.640	12.901 *	-65.917	34.272	28.352
	680.C	63.61 *	36.653	47.013	4.311 *	86.049	46.991	96.619	3.375	1.481	62.356	5.110 *	-80.254	32.812	26.961
	690.C	62.83 *	36.306	46.632	4.352 *	86.023	46.610	106.479	3.344	1.395	62.069	-2.388 *	265.414	32.349	26.521
	700.C	62.85 *	35.948	46.240	4.460 *	86.060	46.209	116.339	3.263	1.302	61.765	-9.561 *	251.764	32.787	26.938
	710.C	63.61 *	35.572	45.826	4.629 *	86.151	45.780	126.199	3.141	1.217	61.449	-16.377 *	239.305	33.941	28.036
	720.C	64.76 *	35.171	45.385	4.847 *	86.285	45.318	136.055	2.987	1.135	61.105	-22.804 *	228.276	35.585	29.608
	730.C	66.15 *	34.741	44.911	5.106 *	86.451	44.819	145.919	2.812	1.058	60.736	-28.814 *	218.694	37.504	31.451
	740.C	67.65 *	34.285	44.408	5.395 *	86.639	44.287	155.779	2.627	1.071	60.345	-34.389 *	210.439	39.532	33.405
635 100	700.C	65.56 *	34.417	44.553	5.194 *	86.469	44.455	67.626	2.760	1.761	60.466	29.702 *	-37.214	37.621	31.563
	710.C	62.52 *	34.107	44.211	4.997 *	86.206	44.140	77.486	2.901	1.681	60.237	21.561 *	-49.862	34.339	28.416
	720.C	55.85 *	33.816	43.861	4.877 *	86.023	43.838	87.346	2.987	1.592	60.015	13.655 *	-63.606	31.871	26.068
	730.C	58.16 *	33.532	43.574	4.834 *	85.916	43.529	97.206	3.015	1.495	59.790	6.015 *	-78.084	30.345	24.624
	740.C	57.37 *	33.248	43.258	4.863 *	85.881	43.214	107.066	3.002	1.400	59.561	-1.336 *	267.330	29.807	24.117
	750.C	57.42 *	32.953	42.930	4.960 *	85.908	42.878	116.926	2.942	1.306	59.318	-8.366 *	253.381	30.177	24.466
	760.C	58.15 *	32.643	42.585	5.117 *	85.990	42.519	126.786	2.847	1.214	59.055	-15.050 *	240.642	31.280	25.508
	770.C	59.23 *	32.303	42.205	5.326 *	86.115	42.120	136.646	2.723	1.121	58.772	-21.353 *	229.400	32.884	27.029
	780.C	60.76 *	31.937	41.756	5.577 *	86.274	41.686	146.506	2.580	1.031	58.463	-27.257 *	219.664	34.782	28.840
	790.C	62.32 *	31.546	41.358	5.860 *	86.455	41.221	156.366	2.427	1.077	58.132	-32.748 *	211.303	36.804	30.777
665 50	750.C	61.28 *	31.567	41.382	5.755 *	86.357	41.257	68.213	2.487	1.778	58.157	30.152 *	-35.084	35.698	29.717
	760.C	57.85 *	31.313	41.098	5.547 *	86.085	41.001	78.073	2.614	1.698	57.976	22.156 *	-47.577	32.410	26.579
	770.C	55.28 *	31.076	40.831	5.414 *	85.893	40.754	87.933	2.654	1.611	57.801	14.394 *	-61.274	29.896	24.201
	780.C	53.54 *	30.845	40.571	5.359 *	85.777	40.504	97.793	2.730	1.517	57.625	6.893 *	-75.852	28.297	22.699
	790.C	52.73 *	30.611	40.307	5.377 *	85.733	40.242	107.653	2.722	1.420	57.441	-0.320 *	269.337	27.672	22.115
	800.C	52.75 *	30.364	40.030	5.463 *	85.751	39.958	117.513	2.675	1.328	57.243	-7.218 *	255.094	27.960	22.384
	810.C	53.45 *	30.100	39.731	5.610 *	85.824	39.646	127.373	2.602	1.231	57.025	-13.776 *	242.071	28.992	23.350
	820.C	54.63 *	29.813	39.406	5.810 *	85.940	39.302	137.233	2.502	1.137	56.787	-19.970 *	230.590	30.549	24.816
	830.C	56.05 *	29.502	39.054	6.053 *	86.091	38.927	147.093	2.386	1.042	56.528	-25.783 *	220.676	32.419	26.588
	840.C	57.67 *	29.167	38.673	6.329 *	86.267	38.519	156.953	2.258	1.062	56.248	-31.202 *	212.187	34.431	28.505
735 0	800.C	57.32 *	29.105	38.602	6.320 *	86.239	38.450	68.800	2.265	1.754	56.201	30.593 *	-33.046	34.123	28.210
	810.C	53.97 *	28.894	38.362	6.099 *	85.958	38.240	78.660	2.380	1.715	56.057	22.736 *	-45.350	30.828	25.080
	820.C	51.37 *	28.698	38.135	5.955 *	85.757	38.037	88.520	2.455	1.625	55.915	15.111 *	-58.953	28.265	22.669
	830.C	49.61 *	28.507	37.921	5.888 *	85.632	37.830	98.380	2.491	1.536	55.779	7.744 *	-73.577	26.584	21.103
	840.C	48.75 *	28.312	37.658	5.895 *	85.578	37.610	108.240	2.452	1.438	55.630	0.660 *	-88.580	25.864	20.436
	850.C	48.72 *	28.106	37.462	5.970 *	85.587	37.369	118.100	2.460	1.342	55.467	-6.117 *	256.892	26.060	20.617
	860.C	49.35 *	27.883	37.206	6.107 *	85.651	37.102	127.960	2.400	1.248	55.287	-12.563 *	243.570	27.017	21.505
	870.C	50.55 *	27.639	36.926	6.298 *	85.760	36.804	137.820	2.315	1.154	55.088	-18.658 *	231.833	28.519	22.908
	880.C	52.01 *	27.373	36.620	6.533 *	85.904	36.475	147.680	2.222	1.065	54.868	-24.388 *	221.723	30.355	24.633
	890.C	53.61 *	27.083	36.285	6.804 *	86.074	36.114	157.540	2.115	1.075	54.625	-29.744 *	213.090	32.350	26.522
ECATE	TTIME	CV SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1

ECATE	TTIME	CV	SLM	*	OV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	CV1
				*				*								*			
785	850.C	53.93	*		26.561	36.144	6.889	*	86.116	35.966	69.387	2.063	1.811	54.521	31.022	*	-31.113	32.825	26.974
515	860.C	50.64	*		26.785	35.941	6.656	*	85.825	35.793	79.247	2.167	1.733	54.418	23.296	*	-43.202	29.524	23.850
	870.C	48.03	*		26.622	35.752	6.500	*	85.615	35.626	89.107	2.256	1.647	54.308	15.801	*	-56.669	26.913	21.408
	880.C	46.24	*		26.463	35.567	6.421	*	85.480	35.455	98.967	2.293	1.554	54.195	8.560	*	-71.293	25.150	19.777
	890.C	45.22	*		26.300	35.378	6.416	*	85.417	35.269	108.827	2.299	1.458	54.074	1.596	*	-86.451	24.330	19.024
	900.C	45.24	*		26.127	35.176	6.481	*	85.418	35.064	118.687	2.276	0.954	53.941	-5.068	*	258.753	24.429	19.115
	910.C	45.86	*		25.938	34.956	6.608	*	85.474	34.832	128.547	2.229	0.972	53.790	-11.411	*	245.129	25.304	19.919
	920.C	46.98	*		25.729	34.713	6.790	*	85.575	34.572	138.407	2.162	0.924	53.622	-17.417	*	233.121	26.745	21.253
	930.C	48.43	*		25.499	34.443	7.018	*	85.713	34.281	148.267	2.081	0.885	53.435	-23.072	*	222.799	28.540	22.927
	940.C	50.03	*		25.246	34.148	7.285	*	85.877	33.960	158.127	1.991	0.828	53.230	-28.371	*	214.008	30.513	24.782
			*					*								*			
885	900.C	51.03	*		25.082	33.954	7.462	*	85.987	33.749	69.974	1.933	1.825	53.095	31.434	*	-29.291	31.749	25.952
265	910.C	47.77	*		24.934	33.781	7.217	*	85.687	33.608	79.834	2.026	1.750	53.006	23.834	*	-41.146	28.444	22.837
	920.C	45.16	*		24.758	33.620	7.049	*	85.466	33.471	89.694	2.091	1.665	52.915	16.461	*	-54.444	25.788	20.366
	930.C	43.34	*		24.665	33.464	6.958	*	85.323	33.328	99.554	2.127	1.573	52.829	9.339	*	-69.023	23.946	18.673
	940.C	42.26	*		24.528	33.302	6.942	*	85.251	33.172	109.414	2.136	1.477	52.730	2.487	*	-84.296	23.025	17.834
	950.C	42.21	*		24.382	33.125	6.996	*	85.243	32.996	119.274	2.120	0.956	52.620	-4.072	*	260.659	23.022	17.832
	960.C	42.77	*		24.220	32.937	7.114	*	85.291	32.794	129.134	2.083	0.976	52.494	-10.321	*	246.734	23.810	18.549
	970.C	43.85	*		24.040	32.724	7.288	*	85.385	32.565	138.994	2.028	0.941	52.351	-16.245	*	234.447	25.186	19.810
	980.C	45.27	*		23.840	32.486	7.510	*	85.516	32.307	148.854	1.960	0.895	52.190	-21.833	*	223.898	26.936	21.430
	990.C	46.87	*		23.620	32.223	7.771	*	85.676	32.019	158.714	1.883	0.839	52.013	-27.081	*	214.936	28.883	23.249
			*					*								*			
885	950.C	48.53	*		23.425	31.991	8.041	*	85.853	31.760	70.561	1.807	1.844	51.854	31.628	*	-27.584	30.853	25.104
215	960.C	45.30	*		23.301	31.842	7.783	*	85.542	31.645	80.421	1.891	1.768	51.783	24.347	*	-39.194	27.546	21.998
	970.C	42.65	*		23.187	31.705	7.602	*	85.312	31.532	90.281	1.991	1.683	51.715	17.091	*	-52.295	24.850	19.501
	980.C	40.82	*		23.075	31.572	7.500	*	85.160	31.413	100.141	1.986	1.592	51.642	10.079	*	-66.788	22.931	17.749
	990.C	39.75	*		22.960	31.433	7.473	*	85.079	31.281	110.001	1.997	1.496	51.562	3.333	*	-82.137	21.911	16.828
	1000.C	39.57	*		22.835	31.283	7.517	*	85.063	31.129	119.861	1.987	0.958	51.470	-3.130	*	262.596	21.805	16.733
	1010.C	40.06	*		22.696	31.116	7.625	*	85.103	30.954	129.721	1.956	0.980	51.364	-9.291	*	248.376	22.504	17.362
	1020.C	41.05	*		22.540	30.928	7.792	*	85.190	30.751	139.581	1.912	0.948	51.242	-15.140	*	235.800	23.810	18.549
	1030.C	42.48	*		22.366	30.717	8.007	*	85.315	30.520	149.441	1.855	0.903	51.103	-20.667	*	225.014	25.513	20.112
	1040.C	44.06	*		22.172	30.482	8.264	*	85.470	30.260	159.301	1.790	0.850	50.949	-25.869	*	215.869	27.432	21.892
			*					*								*			
ECATE	TTIME	CV	SLM	*	OV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	CV1

TABLE XIII. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 URANUS RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	DV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1	
922 1E4	950.C	45.24	*	22.327	30.670	8.296	*	85.580	30.439	76.140	1.775	1.81E	51.056	28.182	* -32.283	28.521	22.909
	1000.C	42.32	*	22.222	30.542	8.070	*	85.305	30.342	86.000	1.842	1.73E	50.997	20.895	* -44.500	25.501	20.100
	1010.C	40.07	*	22.123	30.422	7.922	*	85.109	30.242	95.860	1.887	1.64E	50.938	13.839	* -58.250	23.154	17.951
	1020.C	38.60	*	22.022	30.300	7.852	*	84.988	30.131	105.720	1.910	1.55E	50.872	7.035	* -73.263	21.636	16.581
	1030.C	37.55	*	21.915	30.170	7.855	*	84.937	30.004	115.580	1.911	1.45E	50.797	0.502	* -88.788	21.030	16.039
	1040.C	36.08	*	21.797	30.026	7.928	*	84.946	29.855	125.440	1.895	1.35E	50.705	-5.745	* -256.212	21.298	16.278
	1050.C	34.83	*	21.664	29.863	8.062	*	85.006	29.681	135.300	1.862	1.25E	50.607	-11.691	* -242.604	22.286	17.166
	1060.C	40.04	*	21.514	29.675	8.250	*	85.111	29.480	145.160	1.816	1.15E	50.485	-17.328	* -230.784	23.785	18.526
	1070.C	41.53	*	21.345	29.473	8.485	*	85.249	29.251	155.020	1.760	1.05E	50.356	-22.651	* -220.736	25.593	20.186
	1080.C	43.16	*	21.158	29.243	8.759	*	85.414	28.995	164.880	1.698	0.95E	50.208	-27.660	* -212.239	27.556	22.007
958 15C	1020.C	45.41	*	21.425	29.571	8.838	*	85.639	29.304	71.859	1.668	1.86E	50.387	31.579	* -25.922	29.670	23.988
	1030.C	42.25	*	21.326	29.450	8.566	*	85.318	29.219	81.719	1.740	1.78E	50.337	24.665	* -37.252	26.390	20.923
	1040.C	39.66	*	21.236	29.335	8.373	*	85.079	29.134	91.579	1.792	1.70E	50.288	17.570	* -50.125	23.679	18.429
	1050.C	37.76	*	21.148	29.231	8.258	*	84.917	29.042	101.439	1.825	1.61E	50.235	10.714	* -64.510	21.701	16.640
	1060.C	36.70	*	21.056	29.117	8.219	*	84.827	28.936	111.299	1.837	1.51E	50.174	4.116	* -79.928	20.592	15.649
	1070.C	36.42	*	20.955	28.993	8.252	*	84.803	28.811	121.155	1.831	1.39E	50.102	-2.209	* -264.564	20.386	15.467
	1080.C	36.85	*	20.842	28.853	8.352	*	84.835	28.663	131.019	1.810	1.29E	50.017	-8.247	* -250.018	20.994	16.006
	1090.C	37.83	*	20.713	28.694	8.510	*	84.915	28.490	140.879	1.774	1.19E	49.918	-13.986	* -237.126	22.227	17.112
	1100.C	39.18	*	20.567	28.512	8.720	*	85.034	28.289	150.739	1.725	1.09E	49.803	-19.422	* -226.083	23.876	18.609
	1110.C	40.74	*	20.403	28.309	8.974	*	85.185	28.061	160.599	1.675	0.99E	49.675	-24.553	* -216.748	25.761	20.341
1008 10C	1070.C	43.61	*	20.176	28.026	9.429	*	85.491	27.733	72.446	1.583	1.88E	49.490	32.329	* -24.477	29.079	23.433
	1080.C	40.47	*	20.092	27.921	9.145	*	85.160	27.665	82.306	1.648	1.80E	49.451	25.120	* -35.554	25.804	20.380
	1090.C	37.88	*	20.015	27.825	8.939	*	84.910	27.596	92.166	1.697	1.72E	49.413	18.127	* -48.194	23.062	17.868
	1100.C	35.97	*	19.941	27.732	8.812	*	84.739	27.520	102.026	1.727	1.63E	49.371	11.367	* -62.425	21.020	16.030
	1110.C	34.83	*	19.862	27.633	8.762	*	84.641	27.431	111.886	1.741	1.53E	49.321	4.857	* -77.835	19.819	14.965
	1120.C	34.47	*	19.776	27.525	8.786	*	84.608	27.323	121.746	1.728	1.43E	49.261	-1.386	* -266.498	19.513	14.696
	1130.C	34.83	*	19.678	27.401	8.877	*	84.633	27.192	131.606	1.721	1.33E	49.185	-7.352	* -251.683	20.029	15.151
	1140.C	35.75	*	19.565	27.255	9.028	*	84.707	27.037	141.466	1.691	1.23E	49.103	-13.031	* -238.502	21.191	16.182
	1150.C	37.06	*	19.436	27.097	9.233	*	84.822	26.855	151.326	1.652	1.13E	49.003	-18.418	* -227.206	22.789	17.621
	1160.C	38.60	*	19.291	26.913	9.484	*	84.968	26.648	161.186	1.606	1.03E	48.890	-23.513	* -217.672	24.643	19.311
1058 5C	1120.C	42.02	*	19.057	26.615	10.027	*	85.338	26.295	73.032	1.511	1.90E	48.659	32.658	* -23.138	28.578	22.962
	1130.C	38.91	*	18.984	26.522	9.730	*	84.995	26.241	82.893	1.570	1.82E	48.665	25.550	* -33.964	25.309	19.924
	1140.C	36.32	*	18.921	26.442	9.510	*	84.736	26.189	92.753	1.614	1.73E	48.641	18.651	* -46.369	22.544	17.398
	1150.C	34.37	*	18.857	26.361	9.372	*	84.556	26.127	102.613	1.642	1.64E	48.608	11.981	* -58.423	20.443	15.517
	1160.C	33.17	*	18.791	26.276	9.311	*	84.445	26.052	112.473	1.657	1.55E	48.567	5.555	* -75.792	19.155	14.383
	1170.C	32.75	*	18.716	26.180	9.325	*	84.409	25.958	122.333	1.656	1.45E	48.517	-0.613	* -268.415	18.752	14.031
	1180.C	33.03	*	18.631	26.071	9.408	*	84.427	25.842	132.193	1.642	1.35E	48.456	-6.512	* -253.349	19.177	14.402
	1190.C	33.85	*	18.532	25.944	9.553	*	84.495	25.703	142.053	1.618	1.25E	48.381	-12.134	* -239.881	20.267	15.361
	1200.C	35.16	*	18.418	25.798	9.753	*	84.604	25.538	151.912	1.585	1.15E	48.294	-17.476	* -228.329	21.814	16.741
	1210.C	36.68	*	18.289	25.631	10.000	*	84.747	25.348	161.773	1.545	1.05E	48.194	-22.539	* -218.591	23.635	18.389
1108 C	1160.C	37.53	*	17.991	25.245	10.320	*	84.826	24.938	83.480	1.502	1.84E	47.975	25.951	* -32.491	24.892	19.540
	1170.C	34.94	*	17.935	25.172	10.089	*	84.556	24.895	93.340	1.542	1.75E	47.957	19.144	* -44.646	22.106	17.003
	1200.C	32.97	*	17.882	25.103	9.938	*	84.367	24.847	103.200	1.565	1.66E	47.932	12.558	* -58.513	19.953	15.084
	1210.C	31.71	*	17.825	25.029	9.867	*	84.251	24.783	113.060	1.582	1.57E	47.895	6.211	* -73.810	18.585	13.887
	1220.C	31.22	*	17.761	24.945	9.872	*	84.203	24.702	122.920	1.564	1.47E	47.857	0.114	* -89.699	18.087	13.456
	1230.C	31.43	*	17.687	24.848	9.946	*	84.215	24.600	132.780	1.574	1.37E	47.804	-5.723	* -255.003	18.423	13.747
	1240.C	32.23	*	17.600	24.734	10.084	*	84.277	24.474	142.640	1.554	1.27E	47.740	-11.294	* -241.256	19.441	14.633
	1250.C	33.46	*	17.499	24.602	10.279	*	84.382	24.324	152.500	1.525	1.17E	47.663	-16.595	* -229.446	20.937	15.956
	1260.C	34.95	*	17.384	24.451	10.524	*	84.522	24.150	162.360	1.491	1.07E	47.574	-21.628	* -219.500	22.725	17.562
	1270.C	36.58	*	17.255	24.280	10.812	*	84.689	23.952	172.220	1.452	0.97E	47.474	-26.400	* -211.140	24.662	19.329
ECATE	TTIME	DV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1	

ECATE	TTIME	CV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1		
1156 319	1230.C	36.31	*	17.095	24.069	10.917	*	84.650	23.737	84.067	1.443	1.855	47.366	26.326	*	-31.124	24.538	19.215
	1240.C	33.72	*	17.047	24.005	10.674	*	84.370	23.704	93.927	1.480	1.774	47.350	19.604	*	-43.039	21.736	16.671
	1250.C	31.72	*	17.001	23.943	10.512	*	84.171	23.664	103.787	1.505	1.684	47.330	13.100	*	-56.695	19.537	14.717
	1260.C	30.41	*	16.951	23.878	10.431	*	84.047	23.610	113.647	1.515	1.590	47.303	6.827	*	-71.893	18.093	13.462
	1270.C	29.85	*	16.896	23.804	10.426	*	83.992	23.540	123.507	1.521	1.493	47.268	0.797	*	-87.848	17.505	12.957
	1280.C	30.00	*	16.832	23.720	10.491	*	83.997	23.452	133.367	1.513	0.994	47.224	-4.984	*	256.639	17.756	13.172
	1290.C	30.74	*	16.756	23.617	10.623	*	84.054	23.338	143.227	1.496	0.972	47.168	-10.506	*	242.620	18.702	13.988
	1300.C	31.52	*	16.666	23.497	10.814	*	84.154	23.201	153.087	1.472	0.928	47.100	-15.769	*	230.554	20.146	15.254
	1310.C	33.38	*	16.562	23.357	11.057	*	84.290	23.038	162.947	1.442	0.893	47.020	-20.772	*	220.402	21.898	16.816
	1320.C	35.00	*	16.446	23.201	11.344	*	84.457	22.855	172.807	1.408	0.840	46.930	-25.528	*	211.879	23.817	18.555
1208 269	1280.C	35.22	*	16.285	22.984	11.521	*	84.469	22.627	84.654	1.351	1.876	46.820	26.675	*	-29.860	24.236	18.938
	1290.C	32.63	*	16.244	22.928	11.265	*	84.179	22.603	94.514	1.425	1.752	46.808	20.034	*	-41.537	21.423	16.390
	1300.C	30.61	*	16.204	22.874	11.092	*	83.970	22.572	104.374	1.449	1.702	46.793	13.606	*	-54.982	19.183	14.407
	1310.C	29.26	*	16.162	22.817	11.000	*	83.838	22.528	114.234	1.462	1.607	46.772	7.402	*	-70.063	17.671	13.099
	1320.C	28.64	*	16.113	22.751	10.986	*	83.775	22.467	124.094	1.465	1.510	46.743	1.434	*	-86.054	16.998	12.526
	1330.C	28.72	*	16.056	22.674	11.044	*	83.773	22.386	133.954	1.459	0.999	46.704	-4.291	*	258.252	17.162	12.665
	1340.C	29.40	*	15.989	22.581	11.170	*	83.825	22.283	143.814	1.445	0.976	46.654	-9.767	*	243.973	18.037	13.413
	1350.C	30.53	*	15.909	22.472	11.357	*	83.921	22.157	153.674	1.424	0.943	46.595	-14.995	*	231.651	19.430	14.624
	1360.C	31.96	*	15.817	22.346	11.596	*	84.055	22.009	163.534	1.398	0.900	46.524	-19.975	*	221.285	21.151	16.146
	1370.C	33.57	*	15.713	22.203	11.883	*	84.220	21.838	173.394	1.368	0.848	46.444	-24.716	*	212.600	23.051	17.858
1258 219	1320.C	34.25	*	15.551	21.980	12.132	*	84.281	21.597	85.241	1.246	1.853	46.331	26.999	*	-28.692	23.977	18.701
	1340.C	31.67	*	15.515	21.931	11.863	*	83.981	21.582	95.101	1.377	1.809	46.324	20.435	*	-40.139	21.156	16.152
	1350.C	29.62	*	15.481	21.864	11.678	*	83.764	21.558	104.961	1.399	1.719	46.313	14.078	*	-53.369	18.881	14.144
	1360.C	28.23	*	15.445	21.833	11.576	*	83.623	21.522	114.821	1.412	1.624	46.296	7.940	*	-68.315	17.307	12.788
	1370.C	27.55	*	15.403	21.775	11.553	*	83.553	21.469	124.681	1.415	1.527	46.271	2.030	*	-84.317	16.554	12.151
	1380.C	27.57	*	15.353	21.705	11.604	*	83.545	21.397	134.541	1.411	0.997	46.238	-3.644	*	259.826	16.636	12.220
	1390.C	28.20	*	15.293	21.622	11.724	*	83.591	21.304	144.401	1.399	0.979	46.199	-9.078	*	245.299	17.442	12.903
	1400.C	29.28	*	15.222	21.523	11.906	*	83.683	21.188	154.261	1.381	0.946	46.142	-14.273	*	232.727	18.784	14.059
	1410.C	30.68	*	15.139	21.407	12.144	*	83.815	21.051	164.121	1.358	0.906	46.079	-19.230	*	222.151	20.471	15.541
	1420.C	32.27	*	15.044	21.275	12.431	*	83.978	20.891	173.981	1.322	0.855	46.006	-23.957	*	213.303	22.352	17.225
ECATE	TTIME	CV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1		



TABLE XIII. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 URANUS RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	CV SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1
1295 184	1360.C	35.02 *	15.057	21.345	12.722 *	84.324	20.928	80.960	1.201	1.943	46.023	30.375 *	-23.119	25.304	19.919
	1370.C	32.22 *	15.063	21.301	12.405 *	83.976	20.919	90.820	1.224	1.661	46.015	23.770 *	-33.646	22.281	17.161
	1380.C	29.90 *	15.032	21.258	12.172 *	83.713	20.905	100.680	1.255	1.774	46.012	17.362 *	-45.854	19.714	14.873
	1390.C	28.17 *	15.001	21.213	12.023 *	83.530	20.881	110.540	1.275	1.681	46.001	11.163 *	-59.895	17.756	13.172
	1400.C	27.12 *	14.965	21.164	11.956 *	83.422	20.842	120.400	1.293	1.585	45.984	5.185 *	-75.463	16.555	12.152
	1410.C	26.77 *	14.923	21.105	11.966 *	83.381	20.784	130.260	1.293	1.000	45.958	-0.566 *	268.394	16.192	11.847
	1420.C	27.08 *	14.873	21.033	12.050 *	83.398	20.707	140.120	1.276	0.990	45.923	-6.084 *	252.974	16.623	12.209
	1430.C	27.92 *	14.812	20.948	12.200 *	83.467	20.608	149.980	1.262	0.966	45.878	-11.368 *	239.264	17.694	13.118
	1440.C	29.17 *	14.741	20.846	12.410 *	83.578	20.488	159.840	1.244	0.920	45.824	-16.419 *	227.601	19.209	14.430
	1450.C	30.67 *	14.658	20.729	12.674 *	83.726	20.345	169.700	1.221	0.884	45.761	-21.242 *	217.845	20.996	16.008
1328 150	1400.C	32.93 *	14.638	20.701	12.978 *	83.993	20.283	86.535	1.254	1.912	45.733	27.089 *	-27.726	23.527	18.291
	1410.C	30.37 *	14.609	20.655	12.696 *	83.683	20.277	96.399	1.320	1.828	45.730	20.635 *	-38.948	20.722	15.765
	1420.C	28.34 *	14.581	20.615	12.459 *	83.457	20.263	106.259	1.340	1.737	45.724	14.381 *	-51.972	18.435	13.756
	1430.C	26.93 *	14.551	20.577	12.386 *	83.309	20.236	116.119	1.351	1.643	45.712	8.338 *	-66.790	16.820	12.375
	1440.C	26.21 *	14.516	20.527	12.354 *	83.232	20.192	125.979	1.255	1.545	45.693	2.515 *	-82.803	16.005	11.692
	1450.C	26.18 *	14.474	20.466	12.398 *	83.218	20.130	135.839	1.352	0.957	45.665	-3.083 *	261.182	16.019	11.703
	1460.C	26.75 *	14.423	20.393	12.514 *	83.260	20.047	145.695	1.342	0.981	45.629	-8.452 *	246.418	16.763	12.327
	1470.C	27.75 *	14.361	20.305	12.694 *	83.349	19.943	155.559	1.328	0.952	45.583	-13.592 *	233.611	18.057	13.431
	1480.C	29.16 *	14.285	20.201	12.932 *	83.478	19.817	165.419	1.305	0.911	45.528	-18.509 *	222.841	19.711	14.871
	1490.C	30.72 *	14.206	20.081	13.222 *	83.642	19.670	175.279	1.286	0.862	45.465	-23.208 *	213.847	21.572	16.524
1378 100	1450.C	32.18 *	14.052	19.858	13.607 *	83.791	19.414	87.126	1.260	1.925	45.354	27.361 *	-26.758	23.345	18.125
	1460.C	29.63 *	14.026	19.820	13.312 *	83.470	19.414	96.986	1.264	1.844	45.354	20.975 *	-37.769	20.538	15.601
	1470.C	27.56 *	14.002	19.785	13.103 *	83.235	19.405	106.846	1.302	1.754	45.351	14.783 *	-50.583	18.224	13.575
	1480.C	26.13 *	13.976	19.747	12.980 *	83.079	19.384	116.706	1.312	1.655	45.342	8.797 *	-65.245	16.560	12.156
	1490.C	25.36 *	13.946	19.703	12.939 *	82.995	19.347	126.566	1.317	1.561	45.326	3.024 *	-81.226	15.676	11.419
	1500.C	25.28 *	13.908	19.648	12.977 *	82.975	19.291	136.426	1.315	0.958	45.302	-2.530 *	262.642	15.616	11.370
	1510.C	25.60 *	13.863	19.581	13.086 *	83.012	19.216	146.286	1.307	0.982	45.270	-7.863 *	247.664	16.297	11.935
	1520.C	26.80 *	13.808	19.501	13.263 *	83.098	19.119	156.146	1.294	0.955	45.229	-12.977 *	234.623	17.543	12.989
	1530.C	28.13 *	13.742	19.405	13.500 *	83.225	19.001	166.006	1.278	0.916	45.179	-17.874 *	223.651	19.164	14.391
	1540.C	29.65 *	13.667	19.294	13.791 *	83.387	18.863	175.866	1.258	0.868	45.121	-22.562 *	214.459	21.007	16.018
1428 50	1500.C	31.50 *	13.516	19.071	14.243 *	83.582	18.601	87.713	1.230	1.945	45.012	27.612 *	-25.868	23.185	17.980
	1510.C	28.95 *	13.494	19.037	13.936 *	83.251	18.606	97.573	1.252	1.860	45.014	21.289 *	-36.678	20.378	15.460
	1520.C	26.85 *	13.473	19.006	13.716 *	83.006	18.602	107.433	1.265	1.770	45.013	15.157 *	-49.288	18.044	13.419
	1530.C	25.42 *	13.450	18.972	13.583 *	82.842	18.587	117.293	1.275	1.675	45.006	9.224 *	-63.788	16.334	11.966
	1540.C	24.60 *	13.424	18.932	13.533 *	82.751	18.555	127.153	1.282	1.577	44.993	3.499 *	-79.719	15.386	11.180
	1550.C	24.46 *	13.391	18.883	13.563 *	82.726	18.505	137.013	1.282	0.955	44.973	-2.014 *	264.053	15.257	11.074
	1560.C	24.92 *	13.350	18.822	13.668 *	82.758	18.436	146.873	1.275	0.986	44.944	-7.314 *	248.875	15.876	11.584
	1570.C	25.85 *	13.300	18.748	13.841 *	82.841	18.346	156.733	1.264	0.955	44.908	-12.401 *	235.609	17.074	12.590
	1580.C	27.20 *	13.241	18.655	14.077 *	82.966	18.236	166.593	1.245	0.920	44.863	-17.280 *	224.438	18.664	13.956
	1590.C	28.72 *	13.173	18.556	14.369 *	83.127	18.106	176.453	1.222	0.872	44.810	-21.959 *	215.129	20.488	15.557
1478 C	1550.C	30.88 *	13.026	18.334	14.888 *	83.366	17.838	88.300	1.204	1.961	44.703	27.841 *	-25.052	23.045	17.852
	1560.C	28.34 *	13.006	18.304	14.569 *	83.025	17.848	98.160	1.224	1.876	44.706	21.579 *	-35.671	20.240	15.337
	1570.C	26.27 *	12.988	18.276	14.337 *	82.772	17.849	108.020	1.235	1.785	44.707	15.503 *	-48.082	17.887	13.284
	1580.C	24.77 *	12.968	18.246	14.193 *	82.599	17.838	117.880	1.248	1.690	44.702	9.622 *	-62.419	16.137	11.802
	1590.C	23.52 *	12.945	18.211	14.135 *	82.502	17.812	127.740	1.253	1.592	44.692	3.942 *	-78.286	15.131	10.971
	1600.C	23.73 *	12.916	18.166	14.158 *	82.471	17.767	137.600	1.252	0.955	44.674	-1.533 *	265.410	14.936	10.812
	1610.C	24.15 *	12.879	18.110	14.258 *	82.498	17.704	147.460	1.246	0.987	44.645	-6.801 *	250.047	15.495	11.269
	1620.C	25.06 *	12.834	18.042	14.428 *	82.578	17.620	157.320	1.237	0.962	44.616	-11.864 *	236.565	16.648	12.230
	1630.C	26.34 *	12.781	17.960	14.663 *	82.701	17.517	167.180	1.224	0.925	44.575	-16.726 *	225.201	18.207	13.559
	1640.C	27.85 *	12.719	17.864	14.956 *	82.862	17.394	177.040	1.208	0.878	44.527	-21.395 *	215.738	20.012	15.135
ECATE	TTIME	CV SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1



TABLE XIII. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 URANUS RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	CV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
1662	1740.C	27.67 *	11.532	15.973	17.142 *	82.301	15.403	95.640	1.125	1.574	43.788	25.325 *	-27.642	21.143	16.140
184	1750.C	25.37 *	11.519	15.953	16.824 *	81.971	15.421	105.500	1.147	1.885	43.754	19.352 *	-38.515	18.547	13.854
	1760.C	23.54 *	11.508	15.934	16.599 *	81.729	15.430	115.360	1.156	1.791	43.757	13.553 *	-51.293	16.413	12.032
	1770.C	22.27 *	11.494	15.911	16.467 *	81.570	15.425	125.220	1.161	1.693	43.796	7.933 *	-66.048	14.888	10.773
	1780.C	21.62 *	11.477	15.883	16.424 *	81.486	15.405	135.080	1.162	1.552	43.788	2.496 *	-82.231	14.106	10.143
	1790.C	21.60 *	11.455	15.847	16.467 *	81.470	15.367	144.940	1.162	1.558	43.775	-2.757 *	261.415	14.112	10.148
	1800.C	22.15 *	11.427	15.801	16.591 *	81.512	15.311	154.800	1.157	1.593	43.755	-7.827 *	246.305	14.828	10.724
	1810.C	23.15 *	11.393	15.744	16.790 *	81.607	15.236	164.660	1.151	1.555	43.725	-12.718 *	233.236	16.085	11.759
	1820.C	24.48 *	11.352	15.675	17.058 *	81.748	15.142	174.520	1.141	1.516	43.657	-17.437 *	222.309	17.706	13.129
	1830.C	26.02 *	11.304	15.555	17.391 *	81.929	15.031	184.380	1.131	1.486	43.658	-21.992 *	213.231	19.546	14.725
1657	1770.C	28.61 *	11.306	15.558	17.802 *	82.320	14.986	91.355	1.117	2.024	43.643	28.327 *	-22.662	22.441	17.306
150	1780.C	26.13 *	11.293	15.577	17.431 *	81.937	15.010	101.219	1.130	1.938	43.651	22.305 *	-32.642	19.678	14.841
	1790.C	24.07 *	11.283	15.555	17.154 *	81.648	15.026	111.079	1.125	1.846	43.657	16.457 *	-44.368	17.301	12.783
	1800.C	22.50 *	11.271	15.540	16.970 *	81.445	15.030	120.939	1.146	1.750	43.658	10.779 *	-58.099	15.451	11.233
	1810.C	21.54 *	11.257	15.516	16.880 *	81.322	15.020	130.799	1.145	1.650	43.654	5.280 *	-73.658	14.276	10.279
	1820.C	21.20 *	11.239	15.486	16.878 *	81.271	14.993	140.659	1.145	1.600	43.645	-0.040 *	269.874	13.875	9.959
	1830.C	21.46 *	11.216	15.447	16.961 *	81.284	14.948	150.519	1.147	1.552	43.630	-5.180 *	253.939	14.237	10.248
	1840.C	22.24 *	11.187	15.398	17.124 *	81.353	14.884	160.379	1.141	1.571	43.608	-10.143 *	239.728	15.234	11.055
	1850.C	23.41 *	11.151	15.337	17.360 *	81.472	14.802	170.239	1.134	1.537	43.580	-14.534 *	227.690	16.684	12.261
	1860.C	24.86 *	11.105	15.266	17.664 *	81.634	14.703	180.099	1.125	1.494	43.546	-19.561 *	217.686	18.424	13.747
1747	1820.C	28.23 *	10.954	15.065	18.493 *	82.067	14.429	91.946	1.102	2.035	43.455	28.463 *	-22.154	22.361	17.233
100	1830.C	25.76 *	10.982	15.049	18.110 *	81.673	14.456	101.806	1.112	1.952	43.464	22.491 *	-31.995	19.605	14.777
	1840.C	23.65 *	10.972	15.032	17.822 *	81.375	14.475	111.666	1.122	1.860	43.470	16.683 *	-43.567	17.223	12.717
	1850.C	22.11 *	10.962	15.015	17.629 *	81.164	14.481	121.526	1.128	1.763	43.472	11.044 *	-57.150	15.352	11.152
	1860.C	21.12 *	10.949	14.993	17.530 *	81.035	14.474	131.386	1.131	1.663	43.470	5.578 *	-72.614	14.140	10.170
	1870.C	20.75 *	10.933	14.965	17.522 *	80.979	14.450	141.246	1.131	1.561	43.462	0.287 *	-89.090	13.693	9.815
	1880.C	20.96 *	10.912	14.929	17.601 *	80.988	14.408	151.106	1.125	1.553	43.448	-4.830 *	254.663	14.009	10.066
	1890.C	21.72 *	10.886	14.884	17.762 *	81.055	14.349	160.966	1.125	1.573	43.428	-9.775 *	240.491	14.969	10.839
	1900.C	22.87 *	10.853	14.827	17.998 *	81.172	14.271	170.826	1.118	1.540	43.402	-14.555 *	228.294	16.394	12.017
	1910.C	24.20 *	10.815	14.760	18.305 *	81.335	14.175	180.686	1.110	1.497	43.371	-19.176 *	218.160	18.118	13.483
1757	1870.C	27.67 *	10.705	14.565	19.195 *	81.806	13.901	92.533	1.095	2.053	43.282	28.583 *	-21.691	22.286	17.166
50	1880.C	25.41 *	10.694	14.550	18.799 *	81.402	13.931	102.393	1.098	1.966	43.292	22.657 *	-31.404	19.538	14.719
	1890.C	23.34 *	10.685	14.534	18.499 *	81.094	13.952	112.253	1.106	1.873	43.298	16.889 *	-42.830	17.153	12.657
	1900.C	21.75 *	10.676	14.518	18.297 *	80.876	13.951	122.113	1.111	1.776	43.301	11.287 *	-56.271	15.263	11.079
	1910.C	20.74 *	10.665	14.498	18.190 *	80.741	13.956	131.973	1.114	1.676	43.300	5.853 *	-71.639	14.018	10.072
	1920.C	20.34 *	10.650	14.473	18.176 *	80.679	13.935	141.833	1.115	1.574	43.293	0.589 *	-88.113	13.528	9.685
	1930.C	20.53 *	10.631	14.435	18.251 *	80.685	13.896	151.693	1.112	1.554	43.281	-4.505 *	255.741	13.802	9.901
	1940.C	21.25 *	10.607	14.397	18.410 *	80.749	13.840	161.553	1.105	1.574	43.263	-9.434 *	241.217	14.727	10.642
	1950.C	22.37 *	10.577	14.344	18.647 *	80.866	13.766	171.413	1.102	1.543	43.235	-14.202 *	228.869	16.127	11.794
	1960.C	23.78 *	10.542	14.281	18.956 *	81.029	13.674	181.273	1.096	1.500	43.210	-18.818 *	218.610	17.837	13.241
1847	1920.C	27.54 *	10.438	14.096	19.905 *	81.537	13.400	93.120	1.076	2.067	43.124	28.690 *	-21.272	22.216	17.102
C	1930.C	25.05 *	10.428	14.078	19.497 *	81.122	13.432	102.980	1.085	1.980	43.134	22.806 *	-30.863	19.477	14.665
	1940.C	23.02 *	10.415	14.063	19.186 *	80.805	13.455	112.840	1.092	1.887	43.141	17.078 *	-42.153	17.089	12.603
	1950.C	21.42 *	10.411	14.048	18.974 *	80.580	13.466	122.700	1.097	1.785	43.144	11.510 *	-55.457	15.183	11.014
	1960.C	20.35 *	10.401	14.030	18.860 *	80.438	13.463	132.560	1.095	1.685	43.144	6.107 *	-70.729	13.908	9.985
	1970.C	19.96 *	10.388	14.006	18.840 *	80.372	13.445	142.420	1.100	1.586	43.138	0.870 *	-87.195	13.379	9.568
	1980.C	20.12 *	10.371	13.975	18.911 *	80.374	13.409	152.280	1.098	1.555	43.127	-4.204 *	256.571	13.613	9.752
	1990.C	20.81 *	10.348	13.935	19.068 *	80.436	13.356	162.140	1.095	1.576	43.110	-9.117 *	241.905	14.505	10.463
	2000.C	21.91 *	10.321	13.886	19.305 *	80.552	13.285	172.000	1.090	1.545	43.088	-13.875 *	229.414	15.882	11.589
	2010.C	23.31 *	10.289	13.827	19.618 *	80.716	13.197	181.860	1.082	1.503	43.061	-18.485 *	219.035	17.577	13.018
ECATE	TTIME	CV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	CV1

ECATE	TTIME	CV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	CV1		
			*			*							*					
			*			*							*					
1897	1970.C	27.23	*	10.150	13.647	20.629	*	81.259	12.922	93.707	1.065	2.081	42.978	28.784	*	-20.888	22.150	17.043
219	1980.C	24.80	*	10.180	13.625	20.208	*	80.834	12.955	103.567	1.072	1.952	42.988	22.941	*	-30.366	19.420	14.615
	1990.C	22.72	*	10.172	13.614	19.886	*	80.508	12.980	112.427	1.075	1.900	42.995	17.251	*	-41.526	17.031	12.554
	2000.C	21.12	*	10.165	13.600	19.664	*	80.275	12.994	123.287	1.082	1.802	42.995	11.717	*	-54.700	15.112	10.955
	2010.C	20.06	*	10.155	13.583	19.542	*	80.127	12.993	133.147	1.085	1.701	42.995	6.343	*	-69.876	13.809	9.907
	2020.C	19.61	*	10.143	13.561	19.517	*	80.056	12.977	142.007	1.088	1.557	42.994	1.131	*	-86.327	13.243	9.462
	2030.C	19.75	*	10.129	13.534	19.581	*	80.056	12.946	152.867	1.084	0.995	42.985	-3.925	*	257.353	13.440	9.616
	2040.C	20.41	*	10.105	13.457	19.737	*	80.116	12.896	162.727	1.081	0.577	42.970	-8.823	*	242.556	14.301	10.299
	2050.C	21.45	*	10.084	13.451	19.975	*	80.231	12.828	172.587	1.077	0.547	42.950	-13.571	*	229.929	15.656	11.402
	2060.C	22.87	*	10.054	13.396	20.291	*	80.396	12.743	182.447	1.072	0.506	42.924	-18.177	*	219.435	17.337	12.814
			*			*							*					
1947	2020.C	26.95	*	9.561	13.222	21.358	*	80.974	12.468	94.294	1.055	2.095	42.844	28.863	*	-20.546	22.086	16.985
269	2030.C	24.52	*	9.551	13.204	20.925	*	80.538	12.504	104.154	1.061	2.006	42.854	23.060	*	-29.919	19.367	14.568
	2040.C	22.45	*	9.944	13.191	20.592	*	80.203	12.531	114.014	1.067	1.912	42.862	17.405	*	-40.959	16.978	12.509
	2050.C	20.84	*	9.937	13.177	20.361	*	79.962	12.546	123.874	1.070	1.814	42.866	11.904	*	-54.010	15.046	10.902
	2060.C	19.76	*	9.528	13.161	20.231	*	79.809	12.547	133.734	1.072	1.712	42.867	6.558	*	-69.093	13.719	9.836
	2070.C	19.26	*	9.518	13.141	20.200	*	79.733	12.533	142.594	1.072	1.609	42.862	1.369	*	-85.525	13.120	9.367
	2080.C	19.40	*	9.903	13.114	20.264	*	79.728	12.503	152.454	1.072	0.956	42.854	-3.666	*	258.094	13.282	9.492
	2090.C	20.02	*	9.885	13.075	20.418	*	79.786	12.455	162.314	1.069	0.575	42.840	-8.550	*	243.174	14.112	10.148
	2100.C	21.05	*	9.862	13.036	20.657	*	79.901	12.390	172.174	1.065	0.545	42.821	-13.288	*	230.417	15.446	11.229
	2110.C	22.46	*	9.835	12.984	20.976	*	80.067	12.308	182.034	1.061	0.508	42.797	-17.889	*	219.813	17.114	12.625
			*			*							*					
1997	2070.C	26.68	*	9.748	12.815	22.058	*	80.680	12.036	94.881	1.046	2.108	42.720	28.930	*	-20.238	22.025	16.930
219	2080.C	24.26	*	9.739	12.802	21.652	*	80.234	12.073	104.741	1.051	2.019	42.730	23.165	*	-29.513	19.315	14.523
	2090.C	22.20	*	9.732	12.788	21.309	*	79.890	12.102	114.601	1.056	1.925	42.738	17.544	*	-40.441	16.928	12.466
	2100.C	20.58	*	9.725	12.775	21.068	*	79.642	12.119	124.461	1.059	1.826	42.743	12.074	*	-53.375	14.986	10.853
	2110.C	19.45	*	9.718	12.761	20.931	*	79.482	12.122	134.321	1.061	1.724	42.744	6.755	*	-68.369	13.638	9.772
	2120.C	18.95	*	9.708	12.741	20.894	*	79.402	12.110	144.181	1.061	1.620	42.741	1.588	*	-84.777	13.008	9.280
	2130.C	19.07	*	9.695	12.716	20.955	*	79.394	12.082	154.041	1.060	0.957	42.733	-3.429	*	258.781	13.137	9.380
	2140.C	19.65	*	9.678	12.684	21.108	*	79.450	12.036	163.901	1.058	0.580	42.720	-8.299	*	243.748	13.940	10.011
	2150.C	20.72	*	9.657	12.642	21.348	*	79.564	11.974	173.761	1.055	0.550	42.702	-13.029	*	230.870	15.254	11.072
	2160.C	22.08	*	9.632	12.595	21.671	*	79.731	11.895	182.621	1.050	0.511	42.680	-17.625	*	220.163	16.910	12.452
			*			*							*					
ECATE	TTIME	CV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1		

TABLE XIII. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 URANUS RADII CIRCULAR PARKING ORBIT

ECATE	TIME	CV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMIC	VEL1	ALPHA1	PHI1	VINF1	CV1		
2032 164	2110.C	25.20	*	9.604	12.541	22.367	*	80.219	11.769	100.460	1.C42	2.C71	42.645	25.941	*	-24.694	20.533	15.597
	2120.C	22.56	*	9.557	12.526	21.967	*	79.821	11.803	110.320	1.C47	1.575	42.655	20.276	*	-34.716	17.983	13.367
	2130.C	21.12	*	9.550	12.514	21.670	*	79.522	11.826	120.180	1.C50	1.662	42.661	14.755	*	-46.586	15.810	11.530
	2140.C	19.76	*	9.563	12.501	21.478	*	79.317	11.838	130.040	1.C52	1.781	42.664	9.383	*	-60.558	14.151	10.179
	2150.C	18.97	*	9.575	12.484	21.390	*	79.196	11.834	139.900	1.C52	1.677	42.662	4.160	*	-76.386	13.150	9.390
	2160.C	18.76	*	9.564	12.463	21.402	*	79.152	11.815	149.760	1.C52	1.C00	42.658	-0.914	*	266.977	12.900	9.197
	2170.C	19.12	*	9.550	12.436	21.510	*	79.177	11.779	159.620	1.C52	0.550	42.648	-5.842	*	251.068	13.380	9.570
	2180.C	19.56	*	9.533	12.401	21.709	*	79.264	11.727	169.480	1.C45	0.567	42.634	-10.631	*	237.045	14.458	10.425
	2190.C	21.17	*	9.511	12.358	21.995	*	79.407	11.657	179.340	1.C46	0.532	42.615	-15.285	*	225.261	15.960	11.655
	2200.C	22.64	*	9.485	12.307	22.363	*	79.600	11.572	189.200	1.C42	0.687	42.591	-15.815	*	215.503	17.735	13.154
2067 150	2150.C	23.82	*	9.466	12.274	22.660	*	79.776	11.509	106.035	1.C38	2.C32	42.574	23.012	*	-29.500	19.122	14.355
	2160.C	21.78	*	9.462	12.261	22.305	*	79.425	11.540	115.899	1.042	1.537	42.583	17.444	*	-40.375	16.756	12.321
	2170.C	20.18	*	9.455	12.248	22.059	*	79.171	11.558	125.759	1.C44	1.627	42.587	12.021	*	-53.262	14.825	10.725
	2180.C	19.10	*	9.448	12.235	21.917	*	79.007	11.563	135.619	1.C46	1.735	42.585	6.745	*	-68.229	13.486	9.652
	2190.C	18.60	*	9.435	12.217	21.877	*	78.924	11.552	145.475	1.C46	1.625	42.586	1.615	*	-84.644	12.855	9.162
	2200.C	18.65	*	9.428	12.194	21.938	*	78.916	11.526	155.335	1.C45	0.557	42.575	-3.371	*	258.877	12.979	9.257
	2210.C	19.25	*	9.413	12.164	22.094	*	78.973	11.483	165.199	1.C44	0.580	42.567	-8.217	*	243.793	13.776	9.881
	2220.C	20.33	*	9.394	12.126	22.341	*	79.089	11.423	175.059	1.C41	0.551	42.551	-12.929	*	230.870	15.086	10.934
	2230.C	21.66	*	9.371	12.081	22.673	*	79.260	11.346	184.915	1.C37	0.511	42.531	-17.514	*	220.129	16.740	12.307
	2240.C	23.25	*	9.345	12.025	23.086	*	79.480	11.255	194.779	1.C33	0.662	42.506	-21.983	*	211.226	18.607	13.906
2117 100	2200.C	23.40	*	9.289	11.916	23.411	*	79.449	11.123	106.626	1.C30	2.C44	42.472	23.088	*	-29.178	19.076	14.314
	2210.C	21.57	*	9.283	11.903	23.047	*	79.089	11.155	116.486	1.033	1.548	42.480	17.551	*	-39.956	16.712	12.284
	2220.C	19.56	*	9.277	11.891	22.790	*	78.828	11.175	126.346	1.C35	1.646	42.485	12.156	*	-52.745	14.778	10.683
	2230.C	18.87	*	9.271	11.878	22.641	*	78.658	11.181	136.206	1.026	1.745	42.487	6.903	*	-67.632	13.418	9.599
	2240.C	18.35	*	9.262	11.862	22.597	*	78.572	11.172	146.066	1.C37	1.635	42.485	1.753	*	-84.022	12.763	9.091
	2250.C	18.42	*	9.252	11.840	22.655	*	78.560	11.148	155.926	1.C36	0.597	42.478	-3.177	*	259.452	12.860	9.166
	2260.C	19.01	*	9.238	11.812	22.810	*	78.616	11.107	165.786	1.C34	0.561	42.467	-8.011	*	244.274	13.634	9.769
	2270.C	20.03	*	9.221	11.777	23.059	*	78.732	11.049	175.646	1.032	0.552	42.452	-12.715	*	231.248	14.927	10.805
	2280.C	21.37	*	9.200	11.734	23.395	*	78.904	10.975	185.506	1.C25	0.512	42.433	-17.297	*	220.417	16.571	12.166
	2290.C	22.52	*	9.176	11.685	23.814	*	79.128	10.886	195.366	1.C25	0.664	42.410	-21.766	*	211.444	18.434	13.756
2167 50	2250.C	23.40	*	9.123	11.576	24.172	*	79.113	10.755	107.212	1.C22	2.C55	42.377	23.152	*	-28.890	19.030	14.273
	2260.C	21.36	*	9.117	11.563	23.798	*	78.744	10.787	117.073	1.C25	1.560	42.385	17.645	*	-39.579	16.669	12.248
	2270.C	19.76	*	9.111	11.551	23.533	*	78.476	10.809	126.933	1.C26	1.655	42.390	12.276	*	-52.275	14.730	10.645
	2280.C	18.66	*	9.105	11.535	23.376	*	78.301	10.816	136.793	1.027	1.756	42.392	7.046	*	-67.085	13.356	9.551
	2290.C	18.12	*	9.097	11.523	23.327	*	78.210	10.809	146.653	1.C28	1.645	42.390	1.955	*	-83.450	12.678	9.026
	2300.C	18.17	*	9.088	11.503	23.382	*	78.195	10.786	156.513	1.C27	0.557	42.385	-2.999	*	259.983	12.751	9.082
	2310.C	18.74	*	9.075	11.476	23.537	*	78.250	10.747	166.373	1.C26	0.562	42.375	-7.822	*	244.718	13.504	9.666
	2320.C	19.75	*	9.059	11.443	23.788	*	78.366	10.691	176.233	1.C24	0.554	42.360	-12.519	*	231.596	14.781	10.686
	2330.C	21.08	*	9.040	11.404	24.129	*	78.540	10.619	186.093	1.C21	0.514	42.342	-17.098	*	220.682	16.416	12.035
	2340.C	22.64	*	9.018	11.357	24.555	*	78.766	10.532	195.953	1.C18	0.666	42.321	-21.568	*	211.643	18.274	13.618
2217 C	2300.C	23.20	*	8.968	11.252	24.944	*	78.767	10.401	107.800	1.C15	2.C67	42.288	23.205	*	-28.633	18.984	14.234
	2310.C	21.17	*	8.962	11.235	24.560	*	78.389	10.435	117.660	1.017	1.571	42.257	17.727	*	-39.240	16.628	12.213
	2320.C	19.56	*	8.956	11.227	24.285	*	78.114	10.458	127.520	1.C18	1.670	42.302	12.383	*	-51.849	14.685	10.608
	2330.C	18.46	*	8.951	11.215	24.122	*	77.933	10.467	137.380	1.C19	1.766	42.304	7.175	*	-66.587	13.298	9.505
	2340.C	17.51	*	8.944	11.200	24.068	*	77.838	10.461	147.240	1.C19	1.655	42.302	2.103	*	-82.925	12.600	8.967
	2350.C	17.54	*	8.934	11.181	24.121	*	77.821	10.439	157.100	1.C15	0.558	42.298	-2.838	*	260.472	12.650	9.005
	2360.C	18.45	*	8.923	11.156	24.276	*	77.874	10.402	166.960	1.C16	0.562	42.288	-7.650	*	245.127	13.383	9.572
	2370.C	19.45	*	8.908	11.125	24.528	*	77.991	10.348	176.820	1.C16	0.555	42.275	-12.340	*	231.915	14.647	10.577
ECATE	TIME	CV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMIC	VEL1	ALPHA1	PHI1	VINF1	CV1		
	2380.C	20.81	*	8.891	11.088	24.874	*	78.166	10.278	186.680	1.C14	0.516	42.258	-16.916	*	220.923	16.273	11.915
2390.C	22.36	*	8.871	11.044	25.307	*	78.396	10.193	196.540	1.C11	0.666	42.237	-21.387	*	211.823	18.128	13.491	

ECATE	TIME	DV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1		
2167 219	2350.C	23.02	*	8.823	10.943	25.726	*	78.410	10.063	108.387	1.CC8	2.C7E	42.206	23.248	*	-28.405	18.939	14.195
	2360.C	21.00	*	8.817	10.929	25.332	*	78.024	10.098	118.247	1.C10	1.9E1	42.215	17.797	*	-38.936	16.588	12.179
	2370.C	19.38	*	8.812	10.918	25.049	*	77.741	10.122	128.107	1.011	1.8E0	42.220	12.477	*	-51.465	14.642	10.573
	2380.C	18.27	*	8.806	10.906	24.879	*	77.555	10.132	137.967	1.C11	1.775	42.223	7.291	*	-66.135	13.244	9.463
	2390.C	17.71	*	8.800	10.892	24.821	*	77.456	10.127	147.827	1.C11	1.668	42.222	2.235	*	-82.446	12.528	8.912
	2400.C	17.73	*	8.791	10.873	24.871	*	77.437	10.107	157.687	1.C11	1.558	42.217	-2.691	*	260.919	12.558	8.934
	2410.C	18.27	*	8.781	10.850	25.026	*	77.489	10.071	167.547	1.010	1.5E3	42.208	-7.493	*	245.501	13.273	9.485
	2420.C	19.24	*	8.767	10.821	25.281	*	77.606	10.018	177.407	1.CC5	1.556	42.196	-12.176	*	232.206	14.523	10.477
	2430.C	20.56	*	8.751	10.787	25.630	*	77.783	9.950	187.267	1.CC7	1.517	42.180	-16.750	*	221.141	16.142	11.806
2440.C	22.11	*	8.733	10.745	26.072	*	78.016	9.867	197.127	1.CC5	1.4E5	42.160	-21.222	*	211.985	17.993	13.375	
2117 265	2400.C	22.84	*	8.688	10.648	26.518	*	78.044	9.739	108.974	1.CC2	1.4E5	42.130	23.280	*	-28.205	18.894	14.156
	2410.C	20.83	*	8.682	10.634	26.114	*	77.648	9.774	118.834	1.CC3	1.552	42.138	17.855	*	-38.666	16.548	12.146
	2420.C	19.22	*	8.677	10.622	25.823	*	77.359	9.799	128.694	1.CC4	1.450	42.144	12.560	*	-51.119	14.600	10.539
	2430.C	18.05	*	8.672	10.611	25.647	*	77.167	9.810	138.554	1.CC4	1.7E5	42.147	7.393	*	-65.728	13.193	9.423
	2440.C	17.53	*	8.665	10.597	25.584	*	77.065	9.807	148.414	1.CC4	1.477	42.146	2.355	*	-82.013	12.461	8.861
	2450.C	17.53	*	8.658	10.580	25.632	*	77.042	9.788	158.274	1.CC4	1.558	42.142	-2.558	*	261.327	12.472	8.869
	2460.C	18.05	*	8.648	10.558	25.786	*	77.094	9.753	168.134	1.CC3	1.5E4	42.134	-7.351	*	245.840	13.171	9.406
	2470.C	19.02	*	8.636	10.532	26.042	*	77.212	9.703	177.994	1.CC2	1.557	42.122	-12.029	*	232.467	14.410	10.386
	2480.C	20.32	*	8.621	10.497	26.402	*	77.389	9.635	187.854	1.CC0	1.518	42.106	-16.598	*	221.340	16.020	11.704
2490.C	21.88	*	8.605	10.462	26.843	*	77.629	9.557	197.714	1.555	1.4E1	42.088	-21.076	*	212.123	17.871	13.271	
2167 219	2450.C	22.68	*	8.562	10.366	27.321	*	77.666	9.427	109.561	1.557	1.100	42.055	23.303	*	-28.031	18.849	14.116
	2460.C	20.67	*	8.556	10.352	26.907	*	77.261	9.464	119.421	1.557	1.002	42.068	17.903	*	-38.429	16.508	12.112
	2470.C	19.06	*	8.551	10.340	26.608	*	76.965	9.490	129.281	1.557	1.500	42.073	12.630	*	-50.814	14.560	10.507
	2480.C	17.93	*	8.546	10.329	26.425	*	76.769	9.502	139.141	1.558	1.794	42.076	7.482	*	-65.364	13.144	9.386
	2490.C	17.35	*	8.540	10.316	26.358	*	76.662	9.500	149.001	1.558	1.4E5	42.076	2.461	*	-81.623	12.399	8.814
	2500.C	17.34	*	8.533	10.300	26.404	*	76.638	9.482	158.861	1.557	1.558	42.072	-2.435	*	261.692	12.393	8.809
	2510.C	17.46	*	8.524	10.275	26.560	*	76.688	9.448	168.721	1.557	1.5E4	42.064	-7.222	*	246.147	13.077	9.333
	2520.C	18.81	*	8.512	10.253	26.820	*	76.806	9.399	178.581	1.556	1.557	42.053	-11.854	*	232.706	14.305	10.302
	2530.C	20.11	*	8.499	10.223	27.181	*	76.987	9.334	188.441	1.555	1.515	42.038	-16.463	*	221.512	15.910	11.613
2540.C	21.66	*	8.483	10.187	27.677	*	77.227	9.254	198.301	1.553	1.4E2	42.021	-20.939	*	212.252	17.757	13.172	
ECATE	TIME	DV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1		

TABLE XIII. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 URANUS RADII CIRCULAR PARKING ORBIT

ELATE	TTIME	DV SLM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1
2401	2480.C	23.64 *	8.483	10.186	28.126 *	77.632	9.196	105.28C	C.553	2.152	42.008	25.915 *	-23.581	20.032	15.153
184	2450.C	21.47 *	8.475	10.169	27.651 *	77.167	9.239	115.140	C.553	2.056	42.017	20.475 *	-33.132	17.551	12.997
	2500.C	19.66 *	8.470	10.157	27.291 *	76.815	9.271	125.000	C.553	1.555	42.024	15.158 *	-44.484	15.402	11.193
	2510.C	18.30 *	8.465	10.146	27.048 *	76.568	9.290	134.86C	C.553	1.451	42.025	9.965 *	-57.969	13.712	9.830
	2520.C	17.45 *	8.460	10.134	26.922 *	76.417	9.295	144.72C	C.553	1.742	42.030	4.895 *	-73.498	12.627	8.987
	2530.C	17.16 *	8.454	10.120	26.913 *	76.352	9.286	154.58C	C.553	1.000	42.028	-0.053 *	269.819	12.258	8.707
	2540.C	17.42 *	8.446	10.102	27.016 *	76.367	9.261	164.44C	C.553	C.553	42.022	-4.883 *	253.530	12.617	8.980
	2550.C	18.18 *	8.437	10.080	27.228 *	76.453	9.219	174.300	C.552	C.572	42.013	-5.602 *	238.980	13.596	9.741
	2560.C	19.32 *	8.425	10.053	27.545 *	76.606	9.163	184.16C	C.551	C.529	42.001	-14.217 *	226.695	15.039	10.896
	2570.C	20.76 *	8.411	10.021	27.961 *	76.820	9.091	194.02C	C.550	C.456	41.985	-18.735 *	216.532	16.783	12.344
2436	2520.C	22.36 *	8.400	9.994	28.432 *	77.098	9.016	110.859	C.545	2.105	41.965	23.054 *	-28.294	18.665	13.956
150	2530.C	20.31 *	8.393	9.980	28.010 *	76.687	9.054	120.719	C.985	2.011	41.977	17.695 *	-38.699	16.348	11.978
	2540.C	18.78 *	8.388	9.968	27.706 *	76.387	9.080	130.579	C.985	1.501	41.983	12.457 *	-51.103	14.422	10.396
	2550.C	17.68 *	8.383	9.957	27.521 *	76.188	9.093	140.439	C.985	1.801	41.986	7.341 *	-65.680	13.027	9.295
	2560.C	17.12 *	8.376	9.944	27.454 *	76.081	9.091	150.295	C.985	1.651	41.985	2.346 *	-81.967	12.301	8.739
	2570.C	17.12 *	8.372	9.929	27.502 *	76.057	9.074	160.159	C.985	C.556	41.982	-2.531 *	261.338	12.311	8.747
	2580.C	17.64 *	8.363	9.910	27.664 *	76.110	9.041	170.019	C.986	C.564	41.975	-7.297 *	245.804	13.007	9.279
	2590.C	18.61 *	8.353	9.886	27.934 *	76.232	8.993	179.879	C.986	C.557	41.964	-11.956 *	232.387	14.244	10.253
	2600.C	19.51 *	8.341	9.858	28.307 *	76.419	8.929	189.739	C.987	C.515	41.950	-16.518 *	221.220	15.857	11.569
	2610.C	21.46 *	8.328	9.826	28.779 *	76.667	8.851	199.599	C.986	C.871	41.934	-20.992 *	211.983	17.710	13.133
2466	2570.C	22.21 *	8.252	9.741	29.259 *	76.691	8.733	111.446	C.985	2.115	41.905	23.057 *	-28.174	18.620	13.917
100	2580.C	20.23 *	8.286	9.726	28.828 *	76.272	8.772	121.306	0.984	2.020	41.917	17.720 *	-38.527	16.309	11.945
	2590.C	18.65 *	8.281	9.714	28.517 *	75.965	8.798	131.166	C.984	1.516	41.923	12.503 *	-50.876	14.384	10.365
	2600.C	17.54 *	8.276	9.703	28.326 *	75.761	8.812	141.026	0.984	1.805	41.926	7.405 *	-65.406	12.984	9.261
	2610.C	16.57 *	8.271	9.691	28.255 *	75.651	8.811	150.886	C.983	1.655	41.926	2.425 *	-81.672	12.247	8.699
	2620.C	16.56 *	8.265	9.677	28.303 *	75.625	8.795	160.746	C.983	C.558	41.922	-2.442 *	261.614	12.245	8.697
	2630.C	17.48 *	8.257	9.655	28.465 *	75.677	8.764	170.606	C.983	C.564	41.916	-7.199 *	246.032	12.930	9.220
	2640.C	18.42 *	8.248	9.637	28.738 *	75.801	8.716	180.466	C.982	C.557	41.906	-11.854 *	232.559	14.159	10.185
	2650.C	19.73 *	8.237	9.611	29.117 *	75.990	8.654	190.326	C.982	C.515	41.893	-16.414 *	221.342	15.767	11.495
	2660.C	21.26 *	8.225	9.581	29.597 *	76.242	8.577	200.186	C.981	C.872	41.877	-20.889 *	212.066	17.620	13.055
2536	2620.C	22.07 *	8.191	9.500	30.097 *	76.273	8.461	112.033	C.980	2.125	41.853	23.051 *	-28.075	18.573	13.877
50	2630.C	20.10 *	8.185	9.484	29.658 *	75.845	8.500	121.893	C.979	2.025	41.861	17.737 *	-38.381	16.269	11.912
	2640.C	18.51 *	8.180	9.472	29.338 *	75.532	8.528	131.753	C.979	1.525	41.867	12.540 *	-50.680	14.346	10.335
	2650.C	17.40 *	8.175	9.461	29.142 *	75.323	8.542	141.613	0.978	1.817	41.870	7.459 *	-65.167	12.942	9.229
	2660.C	16.82 *	8.170	9.449	29.068 *	75.209	8.542	151.473	C.978	1.707	41.870	2.492 *	-81.415	12.197	8.661
	2670.C	16.82 *	8.165	9.435	29.114 *	75.182	8.527	161.333	C.978	C.556	41.867	-2.363 *	261.854	12.184	8.651
	2680.C	17.32 *	8.158	9.418	29.277 *	75.233	8.496	171.193	C.978	C.584	41.860	-7.113 *	246.228	12.859	9.165
	2690.C	18.27 *	8.145	9.398	29.554 *	75.358	8.450	181.053	C.971	C.556	41.851	-11.763 *	232.705	14.081	10.123
	2700.C	19.57 *	8.135	9.374	29.939 *	75.550	8.388	190.913	C.971	C.520	41.839	-16.322 *	221.443	15.686	11.427
	2710.C	21.11 *	8.128	9.346	30.427 *	75.806	8.313	200.773	0.977	C.872	41.824	-20.799 *	212.132	17.538	12.985
2566	2670.C	21.93 *	8.057	9.265	30.946 *	75.841	8.198	112.620	C.976	2.135	41.801	23.038 *	-27.997	18.527	13.836
C	2680.C	19.57 *	8.090	9.252	30.497 *	75.405	8.238	122.480	C.975	2.038	41.809	17.746 *	-38.260	16.229	11.879
	2690.C	18.35 *	8.085	9.240	30.171 *	75.086	8.267	132.34C	C.974	1.523	41.814	12.567 *	-50.514	14.308	10.304
	2700.C	17.28 *	8.081	9.225	29.969 *	74.872	8.282	142.200	C.974	1.825	41.817	7.502 *	-64.964	12.902	9.198
	2710.C	16.70 *	8.076	9.217	29.892 *	74.755	8.283	152.060	C.973	1.714	41.818	2.549 *	-81.195	12.149	8.625
	2720.C	16.68 *	8.071	9.204	29.937 *	74.726	8.268	161.920	0.973	C.556	41.815	-2.296 *	262.060	12.127	8.609
	2730.C	17.18 *	8.064	9.188	30.102 *	74.777	8.238	171.780	C.973	C.555	41.805	-7.038 *	246.395	12.794	9.115
	2740.C	18.12 *	8.057	9.165	30.382 *	74.902	8.193	181.640	C.973	C.556	41.800	-11.685 *	232.827	14.010	10.067
	2750.C	19.41 *	8.048	9.147	30.773 *	75.097	8.133	191.500	C.973	C.521	41.788	-16.243 *	221.525	15.612	11.366
	2760.C	20.56 *	8.037	9.121	31.270 *	75.358	8.058	201.360	C.973	C.873	41.774	-20.721 *	212.182	17.464	12.922
ELATE	TTIME	DV SLM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1

ECATE	TIME	CV	SUM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	CV1
				*				*								*			
				*				*								*			
2636	2720.C	21.85	*		8.008	9.047	31.804	*	75.396	7.946	113.207	C.572	2.148	41.752	23.018	*	-27.938	18.479	13.795
215	2720.C	19.85	*		8.001	9.031	31.348	*	74.952	7.986	123.067	C.571	2.047	41.760	17.746	*	-38.163	16.188	11.845
	2740.C	18.27	*		7.996	9.018	31.015	*	74.626	8.015	132.927	C.570	1.942	41.766	12.586	*	-50.377	14.270	10.274
	2750.C	17.16	*		7.992	9.007	30.808	*	74.408	8.031	142.787	C.569	1.833	41.769	7.536	*	-64.793	12.863	9.168
	2760.C	16.58	*		7.988	8.995	30.727	*	74.288	8.033	152.647	C.568	1.721	41.769	2.596	*	-81.009	12.105	8.591
	2770.C	16.55	*		7.983	8.983	30.771	*	74.257	8.019	162.507	C.568	C.568	41.766	-2.239	*	262.232	12.075	8.569
	2780.C	17.05	*		7.977	8.968	30.938	*	74.308	7.990	172.367	C.568	C.568	41.761	-6.975	*	246.534	12.735	9.070
	2790.C	17.55	*		7.970	8.950	31.222	*	74.435	7.945	182.227	C.568	C.568	41.752	-11.617	*	232.925	13.946	10.015
	2800.C	19.27	*		7.962	8.930	31.619	*	74.632	7.886	192.087	C.565	C.521	41.741	-16.174	*	221.588	15.546	11.311
	2810.C	20.82	*		7.952	8.906	32.125	*	74.897	7.812	201.947	C.565	C.874	41.727	-20.655	*	212.217	17.397	12.865
			*					*								*			
2686	2770.C	21.66	*		7.925	8.836	32.673	*	74.938	7.702	113.794	C.568	2.157	41.707	22.990	*	-27.898	18.431	13.753
265	2780.C	19.73	*		7.918	8.818	32.208	*	74.485	7.744	123.654	C.567	2.055	41.714	17.738	*	-38.089	16.147	11.810
	2790.C	18.16	*		7.913	8.805	31.869	*	74.153	7.773	133.514	C.566	1.945	41.720	12.595	*	-50.268	14.233	10.244
	2800.C	17.05	*		7.909	8.794	31.657	*	73.931	7.790	143.374	C.565	1.840	41.723	7.561	*	-64.654	12.824	9.138
	2810.C	16.46	*		7.905	8.783	31.574	*	73.808	7.792	153.234	C.564	1.728	41.723	2.633	*	-80.857	12.062	8.560
	2820.C	16.43	*		7.900	8.771	31.617	*	73.776	7.779	163.094	C.564	C.555	41.721	-2.193	*	262.373	12.027	8.533
	2830.C	16.52	*		7.895	8.757	31.785	*	73.826	7.750	172.954	C.564	C.555	41.715	-6.921	*	246.644	12.680	9.028
	2840.C	17.86	*		7.888	8.741	32.073	*	73.954	7.707	182.814	C.564	C.555	41.707	-11.560	*	233.001	13.888	9.969
	2850.C	19.14	*		7.881	8.722	32.477	*	74.154	7.648	192.674	C.565	C.522	41.697	-16.116	*	221.633	15.486	11.262
	2860.C	20.65	*		7.873	8.700	32.992	*	74.424	7.575	202.534	C.565	C.874	41.683	-20.599	*	212.237	17.338	12.814
			*					*								*			
2726	2820.C	21.56	*		7.847	8.633	33.552	*	74.465	7.467	114.381	C.565	2.166	41.664	22.955	*	-27.875	18.382	13.711
215	2830.C	19.62	*		7.840	8.615	33.080	*	74.005	7.509	124.241	C.563	2.064	41.671	17.723	*	-38.036	16.106	11.776
	2840.C	18.05	*		7.835	8.601	32.734	*	73.666	7.540	134.101	C.562	1.957	41.677	12.597	*	-50.185	14.195	10.214
	2850.C	16.94	*		7.831	8.590	32.517	*	73.439	7.557	143.961	C.561	1.847	41.680	7.577	*	-64.545	12.787	9.110
	2860.C	16.36	*		7.827	8.579	32.431	*	73.314	7.559	153.821	C.560	1.734	41.680	2.661	*	-80.737	12.022	8.530
	2870.C	16.32	*		7.822	8.568	32.475	*	73.280	7.547	163.681	C.560	C.559	41.678	-2.156	*	262.482	11.982	8.499
	2880.C	16.81	*		7.817	8.555	32.644	*	73.331	7.519	173.541	C.560	C.555	41.673	-6.878	*	246.728	12.631	8.990
	2890.C	17.74	*		7.812	8.540	32.937	*	73.460	7.476	183.401	C.560	C.555	41.665	-11.513	*	233.054	13.835	9.928
	2900.C	19.02	*		7.805	8.522	33.347	*	73.663	7.419	193.261	C.561	C.522	41.655	-16.068	*	221.659	15.432	11.218
	2910.C	20.57	*		7.798	8.503	33.871	*	73.938	7.347	203.121	C.562	C.874	41.642	-20.553	*	212.242	17.285	12.770
			*					*								*			
ECATE	TIME	CV	SUM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	CV1



TABLE XIII. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 URANUS RADII CIRCULAR PARKING ORBIT

ECATE	TIME	CV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1
* *																
2771	2850.C	22.51	*	7.799	8.507	34.444 *	74.393	7.284	110.100	C.564	2.219	41.631	25.447 *	-23.619	19.524	14.706
184	2860.C	20.42	*	7.752	8.487	33.903 *	73.867	7.333	119.960	C.562	2.118	41.640	20.177 *	-32.965	17.118	12.628
	2870.C	18.67	*	7.786	8.471	33.491 *	73.467	7.369	129.820	C.560	2.014	41.646	15.013 *	-44.102	15.023	10.882
	2880.C	17.33	*	7.781	8.459	33.210 *	73.185	7.393	139.680	C.555	1.905	41.651	9.953 *	-57.393	13.359	9.553
	2890.C	16.49	*	7.777	8.448	33.059 *	73.011	7.403	149.540	C.558	1.793	41.652	4.997 *	-72.805	12.272	8.718
	2900.C	16.20	*	7.773	8.437	33.041 *	72.933	7.398	159.400	C.557	1.678	41.652	0.141 *	-89.507	11.882	8.425
	2910.C	16.44	*	7.765	8.425	33.151 *	72.944	7.378	169.260	C.557	C.553	41.648	-4.621 *	254.054	12.212	8.673
	2920.C	17.17	*	7.764	8.412	33.388 *	73.037	7.343	179.120	C.558	C.572	41.642	-9.293 *	239.300	13.171	9.406
	2930.C	18.30	*	7.758	8.397	33.747 *	73.207	7.293	188.980	C.558	C.541	41.633	-13.884 *	226.822	14.600	10.539
	2940.C	19.72	*	7.752	8.379	34.223 *	73.450	7.228	198.840	C.559	C.556	41.622	-18.402 *	216.502	16.346	11.976
* *																
2806	2850.C	21.20	*	7.746	8.364	34.769 *	73.754	7.156	115.679	C.561	2.173	41.605	22.640 *	-28.323	18.195	13.550
150	2900.C	19.38	*	7.739	8.346	34.287 *	73.292	7.200	125.539	C.558	2.069	41.617	17.437 *	-38.540	15.944	11.641
	2910.C	17.84	*	7.734	8.332	33.940 *	72.951	7.230	135.395	C.557	1.962	41.622	12.339 *	-50.759	14.061	10.107
	2920.C	16.76	*	7.730	8.320	33.724 *	72.724	7.247	145.259	C.556	1.851	41.625	7.344 *	-65.197	12.683	9.030
	2930.C	16.20	*	7.726	8.310	33.641 *	72.599	7.250	155.119	C.555	1.737	41.625	2.448 *	-81.443	11.950	8.476
	2940.C	16.15	*	7.722	8.295	33.691 *	72.568	7.237	164.979	C.555	C.558	41.623	-2.352 *	261.777	11.941	8.469
	2950.C	16.70	*	7.717	8.287	33.869 *	72.623	7.210	174.839	C.555	C.555	41.618	-7.062 *	246.076	12.617	8.979
	2960.C	17.64	*	7.712	8.273	34.174 *	72.758	7.167	184.695	C.556	C.558	41.611	-11.688 *	232.481	13.841	9.932
	2970.C	18.54	*	7.707	8.258	34.600 *	72.969	7.109	194.559	C.557	C.550	41.601	-16.239 *	221.163	15.453	11.235
	2980.C	20.50	*	7.701	8.241	35.141 *	73.254	7.038	204.415	C.558	C.572	41.585	-20.725 *	211.807	17.318	12.798
* *																
2856	2940.C	21.18	*	7.679	8.181	35.670 *	73.245	6.941	116.266	C.558	2.181	41.573	22.591 *	-28.338	18.145	13.506
100	2950.C	19.28	*	7.672	8.162	35.187 *	72.772	6.984	126.126	C.555	2.077	41.580	17.408 *	-38.530	15.901	11.606
	2960.C	17.74	*	7.667	8.148	34.825 *	72.428	7.016	135.986	C.554	1.965	41.585	12.324 *	-50.733	14.023	10.077
	2970.C	16.67	*	7.662	8.136	34.610 *	72.197	7.033	145.846	C.552	1.857	41.588	7.342 *	-65.154	12.648	9.003
	2980.C	16.11	*	7.655	8.126	34.525 *	72.070	7.036	155.706	C.552	1.743	41.585	2.456 *	-81.396	11.914	8.449
	2990.C	16.10	*	7.655	8.115	34.575 *	72.038	7.024	165.566	C.551	C.558	41.587	-2.335 *	261.815	11.903	8.441
	3000.C	16.60	*	7.651	8.104	34.756 *	72.093	6.997	175.426	C.552	C.555	41.582	-7.040 *	246.097	12.577	8.949
	3010.C	17.55	*	7.646	8.092	35.065 *	72.230	6.955	185.286	C.552	C.558	41.575	-11.663 *	232.483	13.801	9.900
	3020.C	18.84	*	7.642	8.078	35.498 *	72.444	6.898	195.146	C.553	C.550	41.566	-16.214 *	221.148	15.413	11.202
	3030.C	20.40	*	7.636	8.063	36.048 *	72.733	6.827	205.006	C.555	C.572	41.554	-20.702 *	211.779	17.280	12.765
* *																
2906	2950.C	21.08	*	7.616	8.006	36.580 *	72.719	6.733	116.853	C.555	2.185	41.535	22.536 *	-28.368	18.093	13.461
50	3000.C	19.18	*	7.609	7.986	36.092 *	72.239	6.776	126.713	C.552	2.084	41.546	17.370 *	-38.543	15.858	11.569
	3010.C	17.65	*	7.603	7.971	35.734 *	71.887	6.807	136.573	C.550	1.978	41.551	12.303 *	-50.725	13.985	10.047
	3020.C	16.58	*	7.595	7.960	35.506 *	71.655	6.826	146.433	C.549	1.863	41.554	7.332 *	-65.139	12.613	8.976
	3030.C	16.02	*	7.556	7.945	35.420 *	71.525	6.830	156.293	C.548	1.748	41.554	2.457 *	-81.377	11.880	8.424
	3040.C	16.01	*	7.592	7.935	35.470 *	71.492	6.819	166.153	C.548	C.558	41.552	-2.327 *	261.827	11.869	8.415
	3050.C	16.51	*	7.588	7.925	35.654 *	71.548	6.792	176.013	C.549	C.555	41.548	-7.026 *	246.094	12.542	8.922
	3060.C	17.46	*	7.584	7.918	35.968 *	71.687	6.750	185.872	C.549	C.558	41.541	-11.647 *	232.465	13.766	9.872
	3070.C	18.75	*	7.580	7.906	36.407 *	71.904	6.694	195.733	C.551	C.550	41.532	-16.198 *	221.117	15.379	11.174
	3080.C	20.21	*	7.576	7.893	36.967 *	72.198	6.624	205.593	C.552	C.572	41.521	-20.685 *	211.738	17.248	12.738
* *																
2956	3040.C	20.57	*	7.557	7.839	37.500 *	72.177	6.532	117.440	C.552	2.156	41.506	22.476 *	-28.412	18.040	13.416
C	3050.C	19.08	*	7.549	7.818	37.006 *	71.690	6.576	127.300	C.550	2.051	41.513	17.326 *	-38.573	15.813	11.532
	3060.C	17.56	*	7.544	7.802	36.644 *	71.332	6.608	137.160	C.548	1.962	41.518	12.273 *	-50.743	13.947	10.016
	3070.C	16.45	*	7.535	7.790	36.418 *	71.093	6.626	147.020	C.546	1.869	41.521	7.316 *	-65.143	12.578	8.950
	3080.C	15.94	*	7.536	7.780	36.326 *	70.965	6.631	156.880	C.545	1.754	41.522	2.450 *	-81.385	11.848	8.400
	3090.C	15.52	*	7.533	7.771	36.376 *	70.931	6.620	166.740	C.545	C.558	41.520	-2.327 *	261.812	11.837	8.391
	3100.C	16.43	*	7.530	7.761	36.562 *	70.987	6.594	176.600	C.546	C.555	41.516	-7.021 *	246.068	12.510	8.898
	3110.C	17.37	*	7.526	7.751	36.881 *	71.127	6.552	186.460	C.547	C.558	41.510	-11.640 *	232.428	13.735	9.848
	3120.C	18.67	*	7.522	7.741	37.328 *	71.348	6.496	196.320	C.548	C.550	41.501	-16.191 *	221.071	15.350	11.150
	3130.C	20.23	*	7.519	7.730	37.897 *	71.647	6.427	206.180	C.550	C.572	41.490	-20.684 *	211.685	17.222	12.715
* *																
ECATE	TIME	CV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1

ECATE	TIME	CV	SUM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	CV1
				*				*								*			
				*				*								*			
3006	2090.C	20.87	*		7.501	7.678	38.430	*	71.617	6.338	118.027	C.950	2.204	41.476	22.410	*	-28.469	17.987	13.370
319	2100.C	18.99	*		7.493	7.657	37.929	*	71.123	6.383	127.887	C.947	2.096	41.482	17.276	*	-38.620	15.768	11.495
	2110.C	17.47	*		7.488	7.640	37.563	*	70.761	6.415	137.747	C.945	1.986	41.488	12.237	*	-50.782	13.908	9.985
	2120.C	16.41	*		7.484	7.628	37.334	*	70.518	6.433	147.607	C.943	1.875	41.491	7.292	*	-65.178	12.544	8.924
	2130.C	15.86	*		7.480	7.617	37.247	*	70.384	6.437	157.467	C.942	1.759	41.492	2.437	*	-81.415	11.816	8.376
	2140.C	15.85	*		7.477	7.609	37.293	*	70.353	6.428	167.327	C.942	C.956	41.490	-2.334	*	261.771	11.807	8.369
	2150.C	16.35	*		7.474	7.600	37.482	*	70.409	6.402	177.187	C.942	C.956	41.486	-7.024	*	246.020	12.482	8.877
	2160.C	17.20	*		7.471	7.592	37.806	*	70.551	6.361	187.047	C.944	C.956	41.480	-11.640	*	232.372	13.708	9.827
	2170.C	18.60	*		7.468	7.582	38.260	*	70.775	6.305	196.907	C.945	C.950	41.471	-16.192	*	221.010	15.325	11.130
	2180.C	20.16	*		7.465	7.573	38.838	*	71.079	6.236	206.767	C.947	C.872	41.461	-20.687	*	211.619	17.200	12.697
			*					*								*			
3056	2140.C	20.77	*		7.448	7.525	39.368	*	71.039	6.151	118.614	C.948	2.211	41.448	22.338	*	-28.540	17.932	13.323
269	2150.C	18.90	*		7.441	7.502	38.863	*	70.538	6.196	128.474	C.945	2.105	41.455	17.220	*	-38.684	15.722	11.457
	2160.C	17.39	*		7.435	7.485	38.492	*	70.171	6.228	138.234	C.942	1.994	41.460	12.195	*	-50.841	13.869	9.954
	2170.C	16.33	*		7.431	7.473	38.261	*	69.926	6.247	148.194	C.941	1.880	41.462	7.261	*	-65.236	12.510	8.898
	2180.C	15.78	*		7.427	7.462	38.172	*	69.790	6.251	158.054	C.940	1.762	41.463	2.415	*	-81.476	11.786	8.354
	2190.C	15.77	*		7.425	7.452	38.225	*	69.754	6.241	167.914	C.940	C.956	41.462	-2.348	*	261.710	11.780	8.349
	2200.C	16.28	*		7.422	7.445	38.418	*	69.811	6.215	177.774	C.940	C.956	41.458	-7.032	*	245.955	12.457	8.857
	2210.C	17.22	*		7.420	7.438	38.741	*	69.958	6.176	187.634	C.941	C.956	41.452	-11.648	*	232.299	13.685	9.809
	2220.C	18.53	*		7.417	7.431	39.202	*	70.186	6.121	197.494	C.942	C.950	41.444	-16.200	*	220.935	15.305	11.113
	2230.C	20.10	*		7.415	7.424	39.790	*	70.495	6.052	207.354	C.945	C.871	41.433	-20.698	*	211.542	17.183	12.683
			*					*								*			
3106	2190.C	20.67	*		7.399	7.377	40.315	*	70.441	5.970	119.201	C.945	2.218	41.422	22.262	*	-28.623	17.877	13.276
219	2200.C	18.81	*		7.391	7.354	39.805	*	69.935	6.015	129.061	C.942	2.111	41.428	17.159	*	-38.763	15.675	11.418
	2210.C	17.31	*		7.386	7.337	39.430	*	69.563	6.048	138.921	C.940	2.000	41.433	12.147	*	-50.920	13.829	9.923
	2220.C	16.25	*		7.381	7.324	39.197	*	69.315	6.067	148.781	C.938	1.886	41.436	7.224	*	-65.317	12.477	8.873
	2230.C	15.71	*		7.378	7.314	39.107	*	69.178	6.072	158.641	C.937	1.768	41.436	2.386	*	-81.562	11.758	8.333
	2240.C	15.71	*		7.375	7.305	39.161	*	69.142	6.061	168.501	C.937	C.956	41.435	-2.369	*	261.620	11.755	8.331
	2250.C	16.21	*		7.373	7.298	39.357	*	69.199	6.036	178.361	C.938	C.954	41.431	-7.050	*	245.863	12.435	8.841
	2260.C	17.16	*		7.371	7.291	39.692	*	69.344	5.996	188.221	C.935	C.956	41.425	-11.662	*	232.212	13.666	9.794
	2270.C	18.47	*		7.369	7.285	40.161	*	69.574	5.941	198.081	C.941	C.950	41.417	-16.214	*	220.849	15.289	11.100
	2280.C	20.04	*		7.367	7.280	40.752	*	69.892	5.873	207.941	C.942	C.871	41.408	-20.717	*	211.454	17.171	12.673
			*					*								*			
ECATE	TIME	CV	SUM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	CV1

TABLE XIII. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 URANUS RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	CV	SUM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMIC	VEL1	ALPHA1	*	PHI1	VINF1	DV1
314C	3220.C	21.40	*	7.371	7.293	41.268	*	70.310	5.822	114.920	C.546	2.272	41.401	24.660	*	-24.452	18.976	14.227	
184	3220.C	19.59	*	7.362	7.265	40.693	*	69.729	5.872	124.780	C.542	2.167	41.408	19.524	*	-33.779	16.649	12.231	
	3240.C	17.51	*	7.356	7.245	40.250	*	69.291	5.912	134.640	C.535	2.058	41.413	14.478	*	-44.928	14.624	10.559	
	3250.C	16.64	*	7.351	7.230	39.947	*	68.984	5.938	144.500	C.537	1.944	41.417	9.521	*	-58.263	13.024	9.292	
	3260.C	15.85	*	7.347	7.218	39.788	*	68.794	5.950	154.360	C.536	1.827	41.419	4.650	*	-73.739	11.992	8.507	
	3270.C	15.60	*	7.344	7.205	39.774	*	68.710	5.947	164.220	C.536	1.600	41.418	-0.139	*	269.507	11.649	8.252	
	3280.C	15.87	*	7.342	7.202	39.905	*	68.724	5.929	174.080	C.536	0.952	41.416	-4.851	*	253.655	12.019	8.527	
	3290.C	16.42	*	7.339	7.196	40.177	*	68.829	5.896	183.940	C.537	0.672	41.411	-9.493	*	238.337	13.010	9.282	
	3300.C	17.77	*	7.338	7.190	40.587	*	69.020	5.848	193.800	C.536	0.525	41.404	-14.072	*	225.909	14.468	10.433	
	3310.C	19.23	*	7.336	7.185	41.129	*	69.297	5.786	203.660	C.540	0.655	41.395	-18.597	*	215.636	16.243	11.891	
			*				*								*				
2175	3250.C	22.57	*	7.345	7.212	42.256	*	70.211	5.674	110.635	C.547	2.322	41.380	27.066	*	-20.603	20.115	15.226	
150	3260.C	20.45	*	7.335	7.181	41.617	*	69.550	5.730	120.499	C.542	2.222	41.388	21.898	*	-29.214	17.685	13.111	
	3270.C	18.61	*	7.327	7.157	41.107	*	69.042	5.775	130.355	C.535	2.114	41.394	16.819	*	-39.443	15.509	11.281	
	3280.C	17.14	*	7.321	7.140	40.735	*	68.671	5.808	140.219	C.537	2.002	41.399	11.828	*	-51.711	13.695	9.817	
	3290.C	16.12	*	7.317	7.127	40.506	*	68.425	5.827	150.079	C.535	1.887	41.401	6.924	*	-66.224	12.380	8.799	
	3300.C	15.61	*	7.314	7.117	40.423	*	68.291	5.831	159.939	C.534	1.768	41.402	2.102	*	-82.543	11.703	8.292	
	3310.C	15.63	*	7.311	7.105	40.486	*	68.259	5.821	169.799	C.534	0.996	41.400	-2.641	*	260.649	11.742	8.321	
	3320.C	16.17	*	7.309	7.102	40.694	*	68.322	5.795	179.655	C.535	0.583	41.397	-7.313	*	244.980	12.459	8.859	
	3330.C	17.14	*	7.308	7.097	41.043	*	68.475	5.754	189.519	C.536	0.556	41.391	-11.920	*	231.450	13.718	9.835	
	3340.C	18.47	*	7.306	7.093	41.528	*	68.713	5.699	199.379	C.536	0.517	41.382	-16.470	*	220.200	15.361	11.160	
			*				*								*				
3225	3300.C	22.47	*	7.303	7.081	43.226	*	69.573	5.506	111.226	C.545	2.322	41.357	26.964	*	-20.715	20.048	15.168	
100	3310.C	20.35	*	7.292	7.048	42.583	*	68.905	5.563	121.086	0.541	2.229	41.365	21.811	*	-29.325	17.628	13.062	
	3320.C	18.53	*	7.284	7.024	42.070	*	68.391	5.608	130.946	C.537	2.120	41.371	16.746	*	-39.557	15.461	11.242	
	3330.C	17.06	*	7.278	7.006	41.695	*	68.017	5.641	140.806	C.535	2.007	41.376	11.768	*	-51.833	13.655	9.785	
	3340.C	16.65	*	7.274	6.992	41.465	*	67.768	5.660	150.666	C.532	1.851	41.378	6.873	*	-66.356	12.347	8.774	
	3350.C	15.54	*	7.271	6.982	41.382	*	67.633	5.665	160.526	C.532	1.772	41.375	2.060	*	-82.684	11.677	8.273	
	3360.C	15.58	*	7.265	6.975	41.446	*	67.601	5.655	170.386	C.532	0.958	41.377	-2.678	*	260.506	11.723	8.307	
	3370.C	16.12	*	7.267	6.965	41.658	*	67.665	5.629	180.246	C.532	0.583	41.374	-7.346	*	244.842	12.445	8.848	
	3380.C	17.65	*	7.266	6.965	42.012	*	67.819	5.589	190.106	C.534	0.556	41.368	-11.952	*	231.321	13.708	9.827	
	3390.C	18.42	*	7.265	6.962	42.504	*	68.061	5.534	199.966	C.536	0.517	41.361	-16.503	*	220.080	15.356	11.155	
			*				*								*				
2275	3350.C	22.37	*	7.262	6.955	44.203	*	68.914	5.344	111.813	C.542	2.325	41.336	26.858	*	-20.836	19.981	15.108	
50	3360.C	20.26	*	7.252	6.921	43.557	*	68.238	5.401	121.673	C.539	2.225	41.343	21.721	*	-29.447	17.570	13.013	
	3370.C	18.45	*	7.244	6.896	43.041	*	67.719	5.447	131.532	C.535	2.126	41.345	16.669	*	-39.685	15.412	11.201	
	3380.C	16.99	*	7.238	6.877	42.663	*	67.341	5.480	141.393	C.532	2.012	41.354	11.702	*	-51.971	13.615	9.753	
	3390.C	15.58	*	7.234	6.863	42.432	*	67.091	5.499	151.252	C.531	1.896	41.356	6.817	*	-66.508	12.315	8.750	
	3400.C	15.45	*	7.231	6.853	42.349	*	66.955	5.504	161.113	C.530	1.776	41.357	2.011	*	-82.846	11.652	8.255	
	3410.C	15.52	*	7.225	6.846	42.416	*	66.923	5.494	170.973	C.530	0.958	41.356	-2.721	*	260.342	11.705	8.294	
	3420.C	16.07	*	7.227	6.842	42.631	*	66.988	5.469	180.833	C.531	0.582	41.352	-7.386	*	244.686	12.433	8.839	
	3430.C	17.65	*	7.226	6.835	42.990	*	67.144	5.428	190.693	C.532	0.555	41.347	-11.991	*	231.177	13.702	9.822	
	3440.C	18.38	*	7.226	6.837	43.490	*	67.389	5.373	200.553	C.534	0.516	41.340	-16.543	*	219.948	15.354	11.154	
			*				*								*				
3225	3400.C	22.27	*	7.225	6.834	45.187	*	68.231	5.186	112.400	C.542	2.345	41.316	26.748	*	-20.965	19.913	15.048	
C	3410.C	20.18	*	7.214	6.799	44.538	*	67.549	5.244	122.260	C.537	2.241	41.323	21.625	*	-29.580	17.512	12.963	
	3420.C	18.37	*	7.206	6.773	44.019	*	67.025	5.290	132.120	C.532	2.131	41.325	16.587	*	-39.827	15.363	11.161	
	3430.C	16.52	*	7.200	6.754	43.640	*	66.645	5.324	141.980	C.531	2.017	41.333	11.631	*	-52.127	13.574	9.721	
	3440.C	15.52	*	7.196	6.740	43.407	*	66.392	5.344	151.840	C.525	1.900	41.336	6.755	*	-66.679	12.282	8.725	
	3450.C	15.43	*	7.193	6.730	43.325	*	66.255	5.349	161.700	C.526	1.775	41.337	1.957	*	-83.029	11.628	8.237	
	3460.C	15.47	*	7.191	6.723	43.394	*	66.224	5.339	171.560	C.528	0.958	41.335	-2.770	*	260.158	11.689	8.282	
	3470.C	16.02	*	7.185	6.715	43.613	*	66.289	5.313	181.420	C.525	0.583	41.332	-7.432	*	244.512	12.424	8.832	
	3480.C	17.01	*	7.189	6.717	43.978	*	66.447	5.273	191.280	C.530	0.555	41.327	-12.035	*	231.018	13.698	9.819	
	3490.C	18.34	*	7.189	6.718	44.484	*	66.695	5.218	201.140	C.532	0.516	41.320	-16.589	*	219.804	15.356	11.155	
			*				*								*				
ECATE	TTIME	CV	SUM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMIC	VEL1	ALPHA1	*	PHI1	VINF1	DV1

ECATE	TTIME	CV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	CV1	
			*			*							*				
3375 315	345C.C	22.18	*	7.189	6.718	46.176	*	67.526	5.034	112.987	C.540	2.352	41.257	26.635	* -21.103	19.844	14.988
	346C.C	20.05	*	7.178	6.682	45.525	*	66.837	5.092	122.847	C.535	2.247	41.304	21.526	* -29.724	17.452	12.912
	347C.C	18.25	*	7.170	6.656	45.004	*	66.309	5.139	132.707	C.532	2.136	41.310	16.500	* -39.982	15.312	11.119
	348C.C	16.85	*	7.164	6.636	44.624	*	65.926	5.173	142.567	C.529	2.022	41.314	11.555	* -52.298	13.532	9.689
	349C.C	15.86	*	7.160	6.622	44.391	*	65.672	5.193	152.427	C.527	1.904	41.317	6.689	* -66.869	12.250	8.701
	350C.C	15.38	*	7.157	6.612	44.310	*	65.534	5.198	162.287	C.526	1.783	41.317	1.897	* -83.232	11.606	8.220
	3510.C	15.43	*	7.155	6.606	44.381	*	65.503	5.188	172.147	C.526	C.557	41.316	-2.825	* 259.955	11.675	8.272
	352C.C	15.58	*	7.154	6.602	44.603	*	65.569	5.163	182.007	C.527	C.582	41.312	-7.484	* 244.321	12.417	8.828
	3530.C	16.57	*	7.154	6.601	44.974	*	65.729	5.123	191.867	C.525	C.554	41.308	-12.086	* 230.846	13.698	9.819
	354C.C	18.31	*	7.154	6.603	45.487	*	65.980	5.068	201.727	C.531	C.515	41.301	-16.641	* 219.649	15.361	11.159
			*			*							*				
3425 265	350C.C	22.08	*	7.155	6.607	47.179	*	66.791	4.886	113.574	C.535	2.358	41.275	26.515	* -21.246	19.775	14.927
	351C.C	20.00	*	7.145	6.571	46.518	*	66.101	4.946	123.434	C.534	2.252	41.286	21.423	* -29.878	17.392	12.860
	352C.C	18.21	*	7.136	6.543	45.996	*	65.569	4.993	133.294	C.530	2.141	41.292	16.410	* -40.149	15.261	11.077
	3530.C	16.79	*	7.130	6.523	45.615	*	65.184	5.027	143.154	C.527	2.026	41.296	11.475	* -52.485	13.491	9.656
	354C.C	15.80	*	7.126	6.505	45.382	*	64.928	5.047	153.014	C.526	1.907	41.299	6.617	* -67.077	12.218	8.677
	355C.C	15.33	*	7.123	6.495	45.302	*	64.790	5.052	162.874	C.525	1.786	41.299	1.832	* -83.454	11.584	8.204
	356C.C	15.38	*	7.121	6.493	45.376	*	64.759	5.042	172.734	C.525	C.557	41.298	-2.885	* 259.733	11.662	8.262
	357C.C	15.94	*	7.121	6.490	45.602	*	64.826	5.017	182.594	C.525	C.582	41.295	-7.541	* 244.115	12.413	8.824
	358C.C	16.94	*	7.121	6.490	45.978	*	64.988	4.977	192.454	C.527	C.554	41.290	-12.143	* 230.661	13.701	9.821
	359C.C	18.25	*	7.122	6.493	46.498	*	65.242	4.922	202.314	C.530	C.514	41.284	-16.698	* 219.484	15.369	11.166
			*			*							*				
3475 219	355C.C	21.95	*	7.124	6.501	48.177	*	66.037	4.744	114.161	C.537	2.364	41.263	26.398	* -21.401	19.705	14.865
	356C.C	19.92	*	7.113	6.464	47.518	*	65.340	4.804	124.021	C.532	2.258	41.270	21.317	* -30.041	17.331	12.808
	357C.C	18.14	*	7.104	6.436	46.994	*	64.805	4.851	133.881	C.529	2.146	41.275	16.315	* -40.329	15.209	11.035
	358C.C	16.72	*	7.098	6.415	46.613	*	64.418	4.885	143.741	C.526	2.030	41.279	11.390	* -52.686	13.449	9.623
	359C.C	15.75	*	7.094	6.400	46.381	*	64.162	4.906	153.601	C.524	1.911	41.282	6.541	* -67.302	12.187	8.653
	360C.C	15.28	*	7.091	6.391	46.302	*	64.023	4.911	163.461	C.523	1.785	41.282	1.762	* -83.696	11.563	8.189
	361C.C	15.34	*	7.090	6.385	46.378	*	63.992	4.901	173.321	C.523	C.597	41.281	-2.950	* 259.493	11.652	8.254
	362C.C	15.91	*	7.085	6.383	46.609	*	64.061	4.876	183.181	C.524	C.582	41.278	-7.603	* 243.892	12.412	8.823
	363C.C	16.92	*	7.085	6.384	46.990	*	64.224	4.836	193.041	C.526	C.554	41.273	-12.205	* 230.463	13.706	9.826
	364C.C	18.27	*	7.091	6.385	47.517	*	64.480	4.781	202.901	C.528	C.514	41.267	-16.762	* 219.308	15.381	11.176
			*			*							*				
ECATE	TTIME	CV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	CV1	

TABLE XIII. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 URANUS RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	DV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1
351C 164	3590.C	20.81	*	7.057	6.405	48.517 *	65.104	4.680	119.740	C.534	2.213	41.256	23.643 *	-25.868	18.388	13.716
	3600.C	18.89	*	7.087	6.376	47.924 *	64.495	4.734	129.600	C.529	2.203	41.262	18.612 *	-35.328	16.141	11.805
	3610.C	17.30	*	7.080	6.352	47.473 *	64.038	4.775	139.460	C.526	2.085	41.266	13.656 *	-46.670	14.200	10.218
	3620.C	16.11	*	7.075	6.334	47.170 *	63.721	4.802	149.320	C.524	1.971	41.270	8.779 *	-60.238	12.690	9.035
	3630.C	15.40	*	7.071	6.322	47.019 *	63.528	4.815	159.180	C.522	1.845	41.271	3.973 *	-75.921	11.755	8.331
	3640.C	15.22	*	7.069	6.315	47.023 *	63.447	4.813	169.040	C.522	1.000	41.271	-0.767 *	267.250	11.510	8.150
	3650.C	15.56	*	7.068	6.312	47.183 *	63.469	4.795	178.900	C.522	C.591	41.265	-5.445 *	250.906	11.971	8.491
	3660.C	16.37	*	7.068	6.312	47.496 *	63.588	4.762	188.760	C.524	C.566	41.265	-10.069 *	236.402	13.037	9.303
	3670.C	17.57	*	7.070	6.316	47.958 *	63.801	4.714	198.620	C.526	C.534	41.255	-14.646 *	224.210	14.554	10.502
	3680.C	19.08	*	7.072	6.323	48.564 *	64.109	4.651	208.480	C.525	C.688	41.252	-19.186 *	214.136	16.379	12.004
3545 150	3620.C	21.75	*	7.062	6.360	49.538 *	64.905	4.557	115.459	C.535	2.367	41.242	25.576 *	-22.019	19.485	14.672
	3630.C	19.71	*	7.071	6.321	48.893 *	64.204	4.616	125.319	C.530	2.260	41.248	20.918 *	-30.745	17.135	12.642
	3640.C	17.56	*	7.063	6.293	48.370 *	63.679	4.664	135.175	C.527	2.147	41.254	15.934 *	-41.154	15.041	10.898
	3650.C	16.56	*	7.057	6.272	47.996 *	63.296	4.698	145.039	C.524	2.020	41.258	11.027 *	-53.656	13.316	9.519
	3660.C	15.64	*	7.053	6.257	47.772 *	63.045	4.718	154.899	C.522	1.910	41.260	6.192 *	-68.415	12.097	8.586
	3670.C	15.21	*	7.050	6.248	47.704 *	62.913	4.722	164.759	C.521	1.786	41.260	1.425 *	-84.890	11.523	8.160
	3680.C	15.31	*	7.045	6.243	47.792 *	62.887	4.712	174.615	C.521	C.557	41.259	-3.278 *	258.328	11.663	8.263
	3690.C	15.51	*	7.048	6.242	48.035 *	62.961	4.686	184.475	C.522	C.560	41.256	-7.925 *	242.849	12.466	8.864
	3700.C	16.54	*	7.045	6.245	48.431 *	63.131	4.645	194.339	C.524	C.551	41.252	-12.524 *	229.572	13.794	9.895
	3710.C	18.32	*	7.051	6.251	48.974 *	63.394	4.589	204.195	C.527	C.510	41.245	-17.081 *	218.556	15.492	11.267
3555 100	3670.C	21.66	*	7.055	6.265	50.547 *	64.085	4.426	116.046	C.534	2.373	41.227	25.849 *	-22.192	19.413	14.609
	3680.C	19.63	*	7.044	6.225	49.902 *	63.382	4.485	125.906	C.529	2.264	41.234	20.803 *	-30.932	17.072	12.589
	3690.C	17.89	*	7.035	6.196	49.381 *	62.853	4.532	135.766	C.525	2.151	41.235	15.830 *	-41.363	14.989	10.855
	3700.C	16.52	*	7.029	6.174	49.008 *	62.470	4.567	145.626	C.522	2.034	41.242	10.933 *	-53.894	13.274	9.486
	3710.C	15.59	*	7.025	6.160	48.786 *	62.219	4.587	155.486	C.520	1.912	41.245	6.105 *	-68.682	12.067	8.563
	3720.C	15.17	*	7.022	6.150	48.719 *	62.087	4.592	165.346	C.520	1.785	41.246	1.345 *	-85.174	11.505	8.146
	3730.C	15.28	*	7.021	6.146	48.811 *	62.061	4.581	175.206	C.520	C.556	41.244	-3.355 *	258.049	11.656	8.258
	3740.C	15.69	*	7.021	6.146	49.058 *	62.136	4.555	185.066	C.521	C.560	41.242	-8.000 *	242.593	12.470	8.867
	3750.C	16.53	*	7.022	6.150	49.459 *	62.307	4.514	194.926	C.523	C.550	41.237	-12.598 *	229.347	13.806	9.904
	3760.C	18.31	*	7.025	6.158	50.008 *	62.572	4.459	204.786	C.526	C.505	41.231	-17.157 *	218.359	15.511	11.283
3645 50	3720.C	21.57	*	7.025	6.174	51.560 *	63.237	4.299	116.633	C.533	2.378	41.214	25.719 *	-22.371	19.340	14.545
	3730.C	19.55	*	7.018	6.134	50.916 *	62.531	4.358	126.493	C.528	2.265	41.220	20.684 *	-31.129	17.009	12.535
	3740.C	17.82	*	7.009	6.103	50.404 *	61.995	4.406	136.352	C.524	2.155	41.225	15.724 *	-41.580	14.936	10.812
	3750.C	16.46	*	7.003	6.082	50.025 *	61.617	4.441	146.213	C.521	2.037	41.225	10.834 *	-54.146	13.231	9.453
	3760.C	15.54	*	6.999	6.066	49.805 *	61.366	4.461	156.073	C.519	1.915	41.231	6.015 *	-68.965	12.036	8.540
	3770.C	15.13	*	6.996	6.057	49.741 *	61.234	4.466	165.933	C.518	1.791	41.232	1.259 *	-85.475	11.487	8.134
	3780.C	15.25	*	6.995	6.053	49.835 *	61.210	4.455	175.793	C.518	C.556	41.231	-3.437 *	257.753	11.651	8.254
	3790.C	15.67	*	6.995	6.054	50.087 *	61.285	4.429	185.653	C.520	C.575	41.228	-8.080 *	242.324	12.476	8.872
	3800.C	16.51	*	6.997	6.055	50.493 *	61.456	4.388	195.513	C.522	C.550	41.223	-12.678 *	229.111	13.821	9.916
	3810.C	18.30	*	6.999	6.066	51.048 *	61.723	4.332	205.373	C.525	C.505	41.217	-17.239 *	218.153	15.533	11.301
3695 C	3770.C	21.45	*	7.005	6.087	52.577 *	62.358	4.176	117.220	C.532	2.383	41.201	25.586 *	-22.557	19.267	14.481
	3780.C	19.47	*	6.993	6.046	51.933 *	61.651	4.236	127.080	C.527	2.274	41.207	20.563 *	-31.334	16.945	12.481
	3790.C	17.75	*	6.985	6.015	51.422 *	61.116	4.284	136.940	C.523	2.155	41.212	15.613 *	-41.812	14.882	10.768
	3800.C	16.40	*	6.979	5.993	51.047 *	60.736	4.319	146.800	C.520	2.040	41.216	10.732 *	-54.411	13.188	9.420
	3810.C	15.45	*	6.974	5.978	50.829 *	60.487	4.339	156.660	C.518	1.918	41.218	5.919 *	-69.264	12.006	8.518
	3820.C	15.05	*	6.972	5.965	50.767 *	60.355	4.343	166.520	C.517	1.793	41.219	1.170 *	-85.793	11.471	8.122
	3830.C	15.22	*	6.971	5.965	50.865 *	60.331	4.332	176.380	C.517	C.556	41.218	-3.523 *	257.443	11.648	8.252
	3840.C	15.85	*	6.971	5.966	51.121 *	60.406	4.307	186.240	C.518	C.575	41.215	-8.164 *	242.042	12.484	8.878
	3850.C	16.50	*	6.973	5.972	51.533 *	60.578	4.265	196.100	C.521	C.545	41.211	-12.762 *	228.865	13.838	9.930
	3860.C	18.30	*	6.976	5.983	52.093 *	60.845	4.209	205.960	C.524	C.508	41.205	-17.325 *	217.939	15.558	11.321
ECATE	TTIME	DV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1

ECATE	TTIME	CV	SUM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	DV1
				*				*								*			
3745	3820.C	21.40	*		6.582	6.004	53.596	*	61.449	4.057	117.807	C.531	2.388	41.185	25.450	*	-22.750	19.193	14.416
215	3820.C	19.40	*		6.570	5.963	52.954	*	60.742	4.117	127.667	C.526	2.278	41.155	20.439	*	-31.548	16.880	12.426
	3840.C	17.69	*		6.562	5.931	52.445	*	60.207	4.166	137.527	C.522	2.163	41.200	15.499	*	-42.055	14.827	10.723
	3850.C	16.34	*		6.555	5.908	52.079	*	59.822	4.200	147.387	C.515	2.044	41.204	10.627	*	-54.686	13.146	9.387
	3860.C	15.45	*		6.551	5.893	51.857	*	59.579	4.221	157.247	C.517	1.921	41.206	5.821	*	-69.578	11.976	8.495
	3870.C	15.06	*		6.549	5.884	51.799	*	59.448	4.225	167.107	C.516	1.795	41.206	1.076	*	-86.127	11.455	8.110
	3880.C	15.20	*		6.548	5.881	51.900	*	59.424	4.215	176.967	C.516	C.596	41.205	-3.613	*	257.118	11.646	8.251
	3890.C	15.83	*		6.545	5.883	52.160	*	59.500	4.188	186.827	C.517	C.578	41.203	-8.253	*	241.748	12.494	8.886
	3900.C	16.50	*		6.551	5.890	52.576	*	59.671	4.147	196.687	C.920	C.548	41.198	-12.851	*	228.608	13.858	9.946
	3910.C	18.30	*		6.554	5.902	53.142	*	59.939	4.090	206.547	C.523	C.507	41.153	-17.415	*	217.716	15.585	11.344
			*					*								*			
3755	3870.C	21.31	*		6.560	5.925	54.617	*	60.507	3.942	118.394	C.530	2.393	41.178	25.312	*	-22.950	19.119	14.351
269	3880.C	19.32	*		6.549	5.883	53.978	*	59.801	4.003	128.254	C.525	2.282	41.184	20.311	*	-31.769	16.815	12.371
	3890.C	17.62	*		6.540	5.850	53.470	*	59.268	4.051	138.114	C.521	2.166	41.185	15.381	*	-42.308	14.772	10.679
	3900.C	16.25	*		6.534	5.827	53.107	*	58.886	4.086	147.974	C.518	2.046	41.192	10.518	*	-54.979	13.102	9.353
	3910.C	15.40	*		6.525	5.811	52.897	*	58.635	4.106	157.834	C.516	1.923	41.194	5.719	*	-69.902	11.947	8.473
	3920.C	15.02	*		6.527	5.803	52.834	*	58.512	4.111	167.694	C.515	1.797	41.195	0.978	*	-86.476	11.440	8.099
	3930.C	15.18	*		6.526	5.800	52.939	*	58.489	4.100	177.554	C.515	C.596	41.194	-3.707	*	256.779	11.646	8.250
	3940.C	15.82	*		6.527	5.803	53.203	*	58.564	4.074	187.414	C.516	C.578	41.191	-8.346	*	241.442	12.506	8.895
	3950.C	16.89	*		6.529	5.811	53.624	*	58.735	4.032	197.274	C.515	C.548	41.187	-12.544	*	228.343	13.880	9.963
	3960.C	18.30	*		6.533	5.825	54.195	*	59.002	3.976	207.134	C.522	C.506	41.182	-17.511	*	217.486	15.615	11.369
			*					*								*			
3845	3920.C	21.23	*		6.540	5.850	55.641	*	59.530	3.830	118.981	C.528	2.357	41.168	25.171	*	-23.156	19.044	14.286
215	3930.C	19.24	*		6.528	5.807	55.004	*	58.828	3.892	128.841	0.924	2.286	41.174	20.181	*	-31.999	16.749	12.316
	3940.C	17.55	*		6.519	5.774	54.499	*	58.298	3.941	138.701	C.520	2.170	41.178	15.260	*	-42.572	14.717	10.634
	3950.C	16.23	*		6.513	5.750	54.138	*	57.918	3.976	148.561	C.517	2.045	41.182	10.405	*	-55.283	13.059	9.319
	3960.C	15.36	*		6.509	5.734	53.930	*	57.670	3.995	158.421	C.515	1.925	41.182	5.612	*	-70.247	11.917	8.451
	3970.C	15.00	*		6.507	5.726	53.872	*	57.547	4.001	168.281	C.514	1.798	41.184	0.877	*	-86.839	11.426	8.089
	3980.C	15.16	*		6.506	5.723	53.981	*	57.524	3.990	178.141	C.514	C.595	41.183	-3.806	*	256.426	11.647	8.251
	3990.C	15.81	*		6.507	5.727	54.250	*	57.599	3.963	188.001	C.515	C.577	41.180	-8.443	*	241.125	12.521	8.906
	4000.C	16.89	*		6.509	5.736	54.675	*	57.769	3.921	197.861	C.516	C.547	41.176	-13.042	*	228.068	13.905	9.983
	4010.C	18.31	*		6.513	5.752	55.251	*	58.035	3.864	207.721	0.521	C.505	41.171	-17.610	*	217.249	15.648	11.396
			*					*								*			
ECATE	TTIME	CV	SUM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	DV1

TABLE XIII. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 URANUS RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	DV	SUM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	DV1
3879	3560.C	20.10	*	*	6.920	5.775	56.009	*	58.437	3.789	124.560	C.925	2.343	41.164	22.450	*	-27.760	17.764	13.179
164	3570.C	18.27	*	*	6.510	5.737	55.437	*	57.835	3.845	134.420	C.921	2.228	41.165	17.503	*	-37.477	15.602	11.358
	3580.C	16.77	*	*	6.502	5.705	55.008	*	57.389	3.887	144.280	C.917	2.105	41.172	12.623	*	-49.157	13.758	9.866
	3590.C	15.66	*	*	6.897	5.685	54.728	*	57.083	3.914	154.140	C.915	1.586	41.176	7.806	*	-63.103	12.361	8.785
	4000.C	15.08	*	*	6.894	5.677	54.605	*	56.900	3.925	164.000	C.913	1.860	41.177	3.048	*	-79.080	11.558	8.185
	4010.C	15.00	*	*	6.893	5.672	54.634	*	56.834	3.922	173.860	C.912	1.555	41.176	-1.657	*	-264.031	11.451	8.107
	4020.C	15.44	*	*	6.893	5.674	54.830	*	56.862	3.903	183.720	C.914	0.987	41.175	-6.313	*	-247.507	12.039	8.542
	4030.C	16.33	*	*	6.895	5.681	55.184	*	56.987	3.886	192.580	C.916	0.562	41.171	-10.929	*	-233.773	13.208	9.435
	4040.C	17.60	*	*	6.898	5.694	55.692	*	57.205	3.818	203.440	C.919	0.525	41.167	-15.512	*	-221.954	14.804	10.705
	4050.C	19.17	*	*	6.903	5.714	56.347	*	57.521	3.753	213.300	C.922	0.877	41.161	-20.071	*	-212.187	16.691	12.266
3914	3550.C	21.00	*	*	6.513	5.745	57.028	*	58.081	3.686	120.275	C.927	2.358	41.155	24.725	*	-23.854	18.821	14.092
150	4000.C	19.05	*	*	6.901	5.705	56.404	*	57.391	3.747	130.139	C.922	2.286	41.160	19.754	*	-32.808	16.551	12.145
	4010.C	17.35	*	*	6.893	5.672	55.911	*	56.874	3.796	139.995	C.918	2.168	41.165	14.848	*	-43.527	14.549	10.498
	4020.C	16.11	*	*	6.886	5.648	55.561	*	56.507	3.830	149.859	C.915	2.046	41.168	10.007	*	-56.412	12.930	9.220
	4030.C	15.27	*	*	6.882	5.632	55.365	*	56.269	3.849	159.719	C.913	1.521	41.165	5.225	*	-71.534	11.838	8.392
	4040.C	14.55	*	*	6.880	5.624	55.329	*	56.145	3.852	169.575	C.912	1.794	41.170	0.500	*	-88.195	11.404	8.072
	4050.C	15.16	*	*	6.880	5.623	55.445	*	56.133	3.841	179.439	C.913	0.954	41.165	-4.177	*	-255.123	11.681	8.276
	4060.C	15.85	*	*	6.881	5.628	55.727	*	56.212	3.813	189.299	C.914	0.575	41.166	-8.811	*	-239.975	12.601	8.967
	4070.C	16.56	*	*	6.884	5.635	56.165	*	56.384	3.770	199.159	C.917	0.544	41.162	-13.408	*	-227.095	14.021	10.075
	4080.C	18.40	*	*	6.889	5.656	56.754	*	56.651	3.712	209.015	C.920	0.501	41.157	-17.979	*	-216.432	15.790	11.513
3944	4040.C	20.52	*	*	6.895	5.681	58.054	*	57.021	3.584	120.866	C.926	2.402	41.146	24.575	*	-24.076	18.745	14.026
100	4050.C	18.56	*	*	6.883	5.637	57.436	*	56.335	3.645	130.726	C.921	2.285	41.151	19.618	*	-33.058	16.485	12.093
	4060.C	17.23	*	*	6.875	5.603	56.944	*	55.827	3.694	140.586	C.917	2.171	41.155	14.721	*	-43.816	14.493	10.453
	4070.C	16.06	*	*	6.869	5.579	56.598	*	55.464	3.729	150.446	C.914	2.045	41.158	9.886	*	-56.747	12.887	9.187
	4080.C	15.24	*	*	6.865	5.564	56.405	*	55.229	3.748	160.306	C.912	1.523	41.160	5.111	*	-71.913	11.810	8.372
	4090.C	14.53	*	*	6.862	5.556	56.371	*	55.107	3.751	170.166	C.912	1.755	41.160	0.389	*	-88.594	11.393	8.064
	4100.C	15.14	*	*	6.862	5.554	56.500	*	55.087	3.739	180.026	C.912	0.554	41.155	-4.284	*	-254.746	11.686	8.280
	4110.C	15.85	*	*	6.864	5.561	56.779	*	55.171	3.711	189.886	C.914	0.575	41.157	-8.917	*	-239.635	12.621	8.982
	4120.C	16.57	*	*	6.867	5.573	57.222	*	55.340	3.668	199.746	C.916	0.543	41.152	-13.516	*	-226.803	14.051	10.099
	4130.C	18.42	*	*	6.872	5.592	57.814	*	55.604	3.610	209.606	C.919	0.895	41.148	-18.089	*	-216.180	15.829	11.545
4014	4050.C	20.84	*	*	6.878	5.616	55.073	*	55.930	3.485	121.453	C.926	2.406	41.137	24.430	*	-24.305	18.668	13.959
50	4100.C	18.50	*	*	6.867	5.573	58.461	*	55.251	3.548	131.313	C.920	2.252	41.142	19.478	*	-33.317	16.417	12.036
	4110.C	17.27	*	*	6.858	5.538	57.977	*	54.745	3.596	141.173	C.916	2.174	41.147	14.590	*	-44.115	14.437	10.408
	4120.C	16.01	*	*	6.852	5.514	57.635	*	54.387	3.631	151.033	C.913	2.051	41.150	9.763	*	-57.095	12.844	9.154
	4130.C	15.20	*	*	6.848	5.498	57.446	*	54.157	3.650	160.893	C.911	1.524	41.151	4.953	*	-72.305	11.783	8.351
	4140.C	14.90	*	*	6.846	5.490	57.416	*	54.037	3.653	170.753	C.911	1.755	41.152	0.275	*	-89.005	11.383	8.057
	4150.C	15.13	*	*	6.846	5.490	57.547	*	54.017	3.640	180.613	C.911	0.554	41.151	-4.396	*	-254.352	11.693	8.285
	4160.C	15.85	*	*	6.847	5.496	57.840	*	54.090	3.612	190.473	C.913	0.574	41.148	-9.027	*	-239.289	12.641	8.998
	4170.C	16.56	*	*	6.851	5.510	58.279	*	54.264	3.569	200.333	C.915	0.542	41.144	-13.627	*	-226.502	14.083	10.125
	4180.C	18.44	*	*	6.856	5.530	58.875	*	54.523	3.510	210.193	C.919	0.896	41.135	-18.203	*	-215.922	15.869	11.579
4064	4140.C	20.75	*	*	6.863	5.557	60.095	*	54.798	3.391	122.040	C.925	2.410	41.129	24.275	*	-24.540	18.591	13.892
C	4150.C	18.83	*	*	6.851	5.511	59.490	*	54.126	3.453	131.900	C.920	2.256	41.134	19.337	*	-33.583	16.350	11.980
	4160.C	17.21	*	*	6.842	5.476	59.014	*	53.624	3.502	141.760	C.915	2.176	41.136	14.458	*	-44.422	14.381	10.363
	4170.C	15.56	*	*	6.836	5.452	58.673	*	53.277	3.536	151.620	C.912	2.053	41.141	9.636	*	-57.454	12.801	9.121
	4180.C	15.16	*	*	6.832	5.436	58.488	*	53.051	3.555	161.480	C.911	1.526	41.143	4.872	*	-72.709	11.756	8.331
	4190.C	14.86	*	*	6.830	5.428	58.461	*	52.933	3.559	171.340	C.910	1.796	41.143	0.158	*	-89.428	11.374	8.050
	4200.C	15.12	*	*	6.830	5.426	58.597	*	52.913	3.546	181.200	C.911	0.554	41.142	-4.511	*	-253.547	11.701	8.291
	4210.C	15.85	*	*	6.832	5.436	58.892	*	52.984	3.517	191.060	C.912	0.574	41.140	-9.141	*	-238.930	12.664	9.015
	4220.C	16.55	*	*	6.836	5.450	59.344	*	53.144	3.473	200.920	C.915	0.541	41.136	-13.741	*	-226.198	14.117	10.151
	4230.C	18.46	*	*	6.841	5.472	59.935	*	53.405	3.415	210.780	C.918	0.897	41.131	-18.321	*	-215.659	15.912	11.615
ECATE	TTIME	DV	SUM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	DV1

ECATE	TTIME	CV	SLM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	DV1
				*				*								*			
				*				*								*			
4114	4190.C	20.67	*		6.848	5.499	61.114	*	53.628	3.299	122.427	C.924	2.414	41.122	24.126	*	-24.780	18.513	13.824
219	4200.C	18.76	*		6.836	5.453	60.521	*	52.961	3.362	132.487	C.919	2.299	41.127	19.194	*	-33.855	16.282	11.923
	4210.C	17.14	*		6.828	5.418	60.043	*	52.477	3.411	142.347	C.915	2.179	41.131	14.321	*	-44.742	14.324	10.317
	4220.C	15.91	*		6.821	5.393	59.710	*	52.133	3.445	152.207	C.912	2.054	41.134	9.507	*	-57.824	12.758	9.087
	4230.C	15.13	*		6.817	5.377	59.530	*	51.911	3.464	162.067	C.910	1.927	41.135	4.747	*	-73.126	11.729	8.312
	4240.C	14.86	*		6.816	5.370	59.507	*	51.796	3.467	171.927	C.909	1.797	41.136	0.037	*	-89.862	11.365	8.045
	4250.C	15.11	*		6.816	5.370	59.646	*	51.775	3.454	181.787	C.910	C.992	41.134	-4.629	*	253.531	11.711	8.298
	4260.C	15.85	*		6.818	5.378	59.945	*	51.844	3.426	191.647	C.911	C.972	41.132	-5.259	*	238.562	12.689	9.034
	4270.C	17.00	*		6.822	5.394	60.399	*	51.998	3.381	201.507	C.914	C.940	41.128	-13.860	*	225.882	14.153	10.180
	4280.C	18.48	*		6.827	5.417	61.002	*	52.242	3.321	211.367	C.916	C.895	41.124	-18.441	*	215.392	15.957	11.652
			*					*								*			
4164	4240.C	20.59	*		6.834	5.444	62.131	*	52.419	3.211	123.214	C.923	2.417	41.115	23.971	*	-25.027	18.435	13.756
269	4250.C	18.69	*		6.823	5.398	61.539	*	51.770	3.274	133.074	C.918	2.301	41.120	19.047	*	-34.138	16.213	11.865
	4260.C	17.08	*		6.814	5.362	61.073	*	51.290	3.324	142.934	C.914	2.181	41.124	14.182	*	-45.069	14.267	10.271
	4270.C	15.86	*		6.807	5.336	60.752	*	50.947	3.358	152.794	C.911	2.056	41.126	9.376	*	-58.203	12.715	9.055
	4280.C	15.10	*		6.804	5.321	60.571	*	50.736	3.377	162.654	C.909	1.928	41.128	4.620	*	-73.556	11.703	8.292
	4290.C	14.84	*		6.802	5.314	60.553	*	50.623	3.380	172.514	C.909	1.000	41.128	-0.086	*	269.688	11.358	8.039
	4300.C	15.11	*		6.802	5.315	60.695	*	50.603	3.366	182.374	C.909	C.992	41.127	-4.751	*	253.106	11.722	8.306
	4310.C	15.86	*		6.804	5.324	60.997	*	50.668	3.337	192.234	C.911	C.972	41.125	-9.381	*	238.186	12.715	9.054
	4320.C	17.02	*		6.808	5.341	61.454	*	50.816	3.292	202.094	C.914	C.939	41.121	-13.983	*	225.561	14.191	10.211
	4330.C	18.51	*		6.814	5.365	62.058	*	51.052	3.232	211.954	C.917	C.894	41.116	-18.566	*	215.117	16.005	11.691
			*					*								*			
4214	4290.C	20.51	*		6.821	5.392	63.145	*	51.171	3.127	123.801	C.923	2.420	41.108	23.814	*	-25.279	18.356	13.688
219	4300.C	18.62	*		6.809	5.345	62.561	*	50.535	3.190	133.661	C.917	2.304	41.113	18.898	*	-34.427	16.144	11.807
	4310.C	17.03	*		6.801	5.309	62.106	*	50.062	3.239	143.521	C.913	2.183	41.117	14.042	*	-45.405	14.209	10.225
	4320.C	15.82	*		6.794	5.284	61.783	*	49.737	3.274	153.381	C.910	2.057	41.120	9.240	*	-58.598	12.672	9.022
	4330.C	15.06	*		6.791	5.268	61.611	*	49.527	3.293	163.241	C.909	1.928	41.121	4.490	*	-73.997	11.677	8.273
	4340.C	14.82	*		6.789	5.261	61.597	*	49.416	3.295	173.101	C.909	1.000	41.121	-0.213	*	269.228	11.352	8.035
	4350.C	15.10	*		6.789	5.263	61.743	*	49.394	3.282	182.961	C.909	C.992	41.120	-4.876	*	252.671	11.734	8.315
	4360.C	15.87	*		6.792	5.272	62.047	*	49.455	3.252	192.821	C.910	C.971	41.118	-9.505	*	237.802	12.743	9.076
	4370.C	17.04	*		6.796	5.290	62.507	*	49.596	3.207	202.681	C.913	C.938	41.114	-14.109	*	225.233	14.232	10.243
	4380.C	18.53	*		6.802	5.316	63.113	*	49.822	3.147	212.541	C.917	C.893	41.110	-18.695	*	214.837	16.054	11.733
			*					*								*			
ECATE	TTIME	CV	SLM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	CV1



TABLE XIII. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 URANUS RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	CV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	CV1	
4245 184	4320.C	21.43	*	6.819	5.385	64.160	*	50.644	3.035	119.520	C.525	2.476	41.101	26.058	* -21.613	19.421	14.615
	4330.C	19.43	*	6.806	5.331	63.530	*	49.928	3.105	129.380	C.519	2.362	41.107	21.121	* -30.067	17.115	12.625
	4340.C	17.70	*	6.796	5.250	63.015	*	49.394	3.161	139.240	C.515	2.242	41.111	16.242	* -40.151	15.044	10.899
	4350.C	16.30	*	6.788	5.255	62.634	*	49.008	3.203	149.100	C.511	2.115	41.114	11.420	* -52.294	13.310	9.514
	4360.C	15.33	*	6.783	5.239	62.395	*	48.747	3.229	158.960	C.505	1.991	41.116	6.650	* -66.727	12.050	8.550
	4370.C	14.86	*	6.781	5.228	62.307	*	48.596	3.239	168.820	C.506	1.860	41.117	1.927	* -83.038	11.408	8.075
	4380.C	14.90	*	6.780	5.226	62.380	*	48.534	3.233	178.680	C.508	C.598	41.116	-2.752	* 260.088	11.470	8.121
	4390.C	15.45	*	6.782	5.232	62.611	*	48.554	3.211	188.540	C.505	C.582	41.115	-7.396	* 244.311	12.209	8.670
	4400.C	16.45	*	6.785	5.247	63.000	*	48.652	3.173	198.400	C.511	C.555	41.112	-12.011	* 230.670	13.499	9.663
4410.C	17.81	*	6.791	5.270	63.538	*	48.830	3.120	208.260	C.515	C.514	41.108	-16.606	* 219.322	15.186	11.016	
4244 150	4360.C	20.20	*	6.804	5.322	64.518	*	49.333	3.019	125.099	C.521	2.415	41.100	23.350	* -26.053	18.133	13.496
	4370.C	18.43	*	6.792	5.274	63.952	*	48.728	3.082	134.959	C.516	2.202	41.105	18.449	* -35.334	15.946	11.642
	4380.C	16.88	*	6.783	5.239	63.510	*	48.285	3.130	144.819	C.512	2.175	41.105	13.605	* -46.485	14.044	10.094
	4390.C	15.71	*	6.777	5.213	63.205	*	47.976	3.164	154.679	C.505	2.053	41.111	8.815	* -59.871	12.551	8.929
	4400.C	15.00	*	6.774	5.198	63.053	*	47.774	3.181	164.539	C.508	1.923	41.112	4.074	* -75.431	11.612	8.225
	4410.C	14.80	*	6.772	5.192	63.049	*	47.675	3.183	174.399	C.507	1.000	41.113	-0.623	* 267.742	11.349	8.032
	4420.C	15.13	*	6.773	5.195	63.208	*	47.655	3.168	184.259	C.508	C.591	41.111	-5.282	* 251.278	11.791	8.357
	4430.C	15.93	*	6.776	5.206	63.524	*	47.713	3.138	194.115	C.510	C.565	41.105	-5.910	* 236.591	12.849	9.157
	4440.C	17.14	*	6.780	5.226	63.993	*	47.845	3.091	203.975	C.512	C.534	41.106	-14.514	* 224.216	14.374	10.357
4450.C	18.66	*	6.787	5.254	64.607	*	48.058	3.029	213.839	C.517	C.888	41.101	-19.104	* 213.983	16.222	11.873	
4334 100	4410.C	20.22	*	6.793	5.276	65.523	*	47.987	2.942	125.686	C.521	2.422	41.095	23.189	* -26.321	18.053	13.427
	4420.C	18.37	*	6.781	5.228	64.967	*	47.401	3.005	135.546	C.516	2.204	41.095	18.296	* -35.642	15.876	11.585
	4430.C	16.82	*	6.772	5.192	64.532	*	46.973	3.054	145.406	C.512	2.181	41.102	13.459	* -46.846	13.987	10.048
	4440.C	15.66	*	6.766	5.167	64.238	*	46.670	3.087	155.266	C.505	2.054	41.105	8.674	* -60.291	12.509	8.897
	4450.C	14.97	*	6.762	5.152	64.084	*	46.483	3.105	165.126	C.507	1.923	41.107	3.937	* -75.903	11.588	8.208
	4460.C	14.79	*	6.761	5.146	64.088	*	46.382	3.106	174.986	C.507	1.000	41.107	-0.757	* 267.257	11.346	8.030
	4470.C	15.13	*	6.762	5.145	64.250	*	46.360	3.091	184.846	C.507	C.591	41.106	-5.414	* 250.823	11.807	8.370
	4480.C	15.95	*	6.765	5.162	64.569	*	46.411	3.060	194.706	C.505	C.568	41.103	-10.042	* 236.193	12.881	9.182
	4490.C	17.16	*	6.770	5.183	65.040	*	46.533	3.013	204.566	C.512	C.533	41.100	-14.648	* 223.878	14.419	10.393
4500.C	18.70	*	6.777	5.212	65.654	*	46.731	2.951	214.426	C.516	C.888	41.095	-19.241	* 213.694	16.277	11.919	
4334 50	4460.C	20.14	*	6.782	5.233	66.524	*	46.600	2.869	126.273	C.520	2.425	41.085	23.025	* -26.594	17.973	13.358
	4470.C	18.30	*	6.770	5.185	65.977	*	46.035	2.933	136.133	C.515	2.206	41.094	18.141	* -35.958	15.806	11.527
	4480.C	16.76	*	6.762	5.148	65.550	*	45.624	2.981	145.992	C.511	2.182	41.097	13.310	* -47.217	13.930	10.003
	4490.C	15.62	*	6.756	5.123	65.259	*	45.337	3.014	155.853	C.508	2.054	41.100	8.531	* -60.725	12.467	8.865
	4500.C	14.94	*	6.752	5.108	65.115	*	45.152	3.032	165.713	C.507	1.923	41.101	3.798	* -76.385	11.566	8.191
	4510.C	14.78	*	6.751	5.102	65.127	*	45.049	3.032	175.573	C.506	1.000	41.101	-0.893	* 266.763	11.344	8.029
	4520.C	15.13	*	6.752	5.106	65.290	*	45.028	3.017	185.433	C.507	C.590	41.100	-5.549	* 250.361	11.825	8.383
	4530.C	15.96	*	6.755	5.120	65.611	*	45.071	2.986	195.293	C.505	C.567	41.098	-10.177	* 235.790	12.916	9.209
	4540.C	17.15	*	6.760	5.142	66.083	*	45.180	2.939	205.153	C.512	C.532	41.094	-14.785	* 223.535	14.465	10.431
4550.C	18.72	*	6.768	5.173	66.696	*	45.361	2.876	215.012	C.516	C.885	41.090	-19.381	* 213.402	16.333	11.966	
4434 C	4510.C	20.06	*	6.772	5.152	67.519	*	45.172	2.800	126.860	C.520	2.427	41.085	22.860	* -26.873	17.893	13.289
	4520.C	18.23	*	6.761	5.144	66.982	*	44.630	2.863	136.720	C.514	2.208	41.085	17.983	* -36.280	15.736	11.469
	4530.C	16.71	*	6.752	5.107	66.564	*	44.237	2.912	146.580	C.510	2.183	41.092	13.159	* -47.596	13.872	9.957
	4540.C	15.56	*	6.746	5.081	66.280	*	43.962	2.945	156.440	C.508	2.055	41.095	8.385	* -61.167	12.426	8.834
	4550.C	14.92	*	6.742	5.066	66.145	*	43.780	2.961	166.300	C.506	1.924	41.096	3.657	* -76.877	11.544	8.175
	4560.C	14.77	*	6.741	5.061	66.155	*	43.687	2.962	176.160	C.506	1.000	41.096	-1.032	* 266.257	11.343	8.028
	4570.C	15.14	*	6.742	5.066	66.331	*	43.650	2.946	186.020	C.507	C.590	41.095	-5.686	* 249.893	11.844	8.397
	4580.C	15.96	*	6.746	5.080	66.648	*	43.693	2.915	195.880	C.505	C.566	41.093	-10.315	* 235.380	12.952	9.236
	4590.C	17.22	*	6.751	5.103	67.121	*	43.788	2.867	205.740	C.512	C.530	41.089	-14.925	* 223.187	14.514	10.470
4600.C	18.77	*	6.755	5.136	67.734	*	43.950	2.804	215.600	C.516	C.883	41.085	-19.524	* 213.106	16.391	12.014	
ECATE	TTIME	CV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	CV1	

ELATE	TIME	CV	SLM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMIC	VEL1	ALPHA1 *	PHI1	VINF1	CV1		
			*			*							*					
4484	4560.C	19.58	*	6.763	5.154	68.509	*	43.702	2.733	127.447	C.519	2.430	41.080	22.693	*	-27.157	17.812	13.220
215	4570.C	18.16	*	6.751	5.105	67.981	*	43.186	2.796	137.307	C.514	2.305	41.084	17.823	*	-36.610	15.666	11.411
	4580.C	16.65	*	6.743	5.068	67.572	*	42.812	2.845	147.167	C.510	2.185	41.088	13.006	*	-47.983	13.815	9.911
	4590.C	15.54	*	6.737	5.042	67.296	*	42.552	2.878	157.027	C.507	2.056	41.090	8.237	*	-61.619	12.385	8.803
	4600.C	14.85	*	6.733	5.027	67.173	*	42.369	2.994	166.887	C.506	1.923	41.091	3.513	*	-77.377	11.522	8.159
	4610.C	14.76	*	6.732	5.023	67.183	*	42.285	2.895	176.747	C.505	1.000	41.091	-1.174	*	265.743	11.344	8.029
	4620.C	15.15	*	6.733	5.028	67.356	*	42.251	2.879	186.607	C.506	C.585	41.090	-5.828	*	249.413	11.865	8.413
	4630.C	16.00	*	6.737	5.043	67.690	*	42.264	2.846	196.467	C.508	C.565	41.088	-10.455	*	234.968	12.989	9.265
	4640.C	17.25	*	6.742	5.067	68.153	*	42.356	2.799	206.327	C.511	C.525	41.085	-15.067	*	222.835	14.564	10.510
	4650.C	18.82	*	6.751	5.101	68.765	*	42.495	2.735	216.187	C.516	C.581	41.080	-19.670	*	212.806	16.451	12.065
			*			*							*					
4534	4610.C	19.50	*	6.754	5.116	69.492	*	42.190	2.670	128.034	C.515	2.432	41.076	22.524	*	-27.447	17.731	13.150
265	4620.C	18.09	*	6.743	5.068	68.975	*	41.703	2.733	137.894	0.913	2.311	41.080	17.662	*	-36.946	15.595	11.352
	4630.C	16.60	*	6.734	5.031	68.575	*	41.351	2.782	147.754	C.505	2.186	41.082	12.851	*	-48.380	13.757	9.866
	4640.C	15.50	*	6.728	5.005	68.306	*	41.105	2.814	157.614	0.507	2.056	41.086	8.086	*	-62.082	12.344	8.772
	4650.C	14.87	*	6.725	4.991	68.180	*	40.943	2.831	167.474	C.505	1.923	41.087	3.365	*	-77.896	11.502	8.144
	4660.C	14.75	*	6.724	4.986	68.208	*	40.843	2.831	177.334	C.505	C.595	41.087	-1.318	*	265.222	11.345	8.030
	4670.C	15.15	*	6.725	4.993	68.376	*	40.816	2.815	187.194	C.506	C.585	41.086	-5.972	*	248.926	11.888	8.429
	4680.C	16.02	*	6.729	5.008	68.710	*	40.818	2.782	197.054	C.508	C.564	41.083	-10.600	*	234.545	13.028	9.296
	4690.C	17.25	*	6.735	5.034	69.180	*	40.884	2.733	206.914	C.511	C.528	41.080	-15.213	*	222.478	14.616	10.552
	4700.C	18.86	*	6.743	5.065	69.790	*	40.998	2.669	216.774	C.515	C.580	41.076	-19.819	*	212.502	16.513	12.117
			*			*							*					
4584	4660.C	19.83	*	6.746	5.084	70.469	*	40.638	2.610	128.621	C.518	2.434	41.072	22.354	*	-27.742	17.649	13.081
215	4670.C	18.03	*	6.735	5.034	69.963	*	40.181	2.673	138.481	0.913	2.312	41.076	17.499	*	-37.290	15.524	11.294
	4680.C	16.55	*	6.726	4.996	69.572	*	39.852	2.721	148.341	C.505	2.186	41.075	12.693	*	-48.785	13.699	9.820
	4690.C	15.46	*	6.720	4.971	69.311	*	39.622	2.754	158.201	C.506	2.056	41.082	7.934	*	-62.555	12.303	8.741
	4700.C	14.85	*	6.717	4.956	69.191	*	39.469	2.770	168.061	C.505	1.923	41.083	3.216	*	-78.420	11.482	8.129
	4710.C	14.75	*	6.716	4.953	69.220	*	39.375	2.770	177.921	C.504	C.595	41.083	-1.465	*	264.688	11.348	8.032
	4720.C	15.16	*	6.717	4.955	69.400	*	39.329	2.753	187.781	C.505	C.588	41.082	-6.117	*	248.437	11.911	8.447
	4730.C	16.05	*	6.721	4.976	69.728	*	39.330	2.720	197.641	C.508	C.563	41.075	-10.747	*	234.118	13.069	9.327
	4740.C	17.32	*	6.727	5.002	70.204	*	39.366	2.671	207.501	C.511	C.526	41.076	-15.361	*	222.119	14.670	10.596
	4750.C	18.91	*	6.736	5.035	70.817	*	39.445	2.606	217.361	C.515	C.578	41.072	-19.969	*	212.198	16.576	12.169
			*			*							*					
ELATE	TIME	CV	SLM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMIC	VEL1	ALPHA1 *	PHI1	VINF1	CV1		

TABLE XIII. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 URANUS RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	DV SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1
* * * * *															
461E	4650.C	20.71 *	6.748	5.09C	71.416 *	39.794	2.534	124.240	C.52C	2.491	41.067	24.555 *	-23.952	18.677	13.967
1E4	4700.C	18.80 *	6.735	5.033	70.869 *	39.291	2.605	134.200	C.515	2.372	41.072	19.684 *	-32.759	16.451	12.064
	4710.C	17.17 *	6.724	4.990	70.429 *	38.925	2.660	144.060	C.51C	2.246	41.075	14.860 *	-43.314	14.478	10.441
	4720.C	15.85 *	6.717	4.955	70.110 *	38.665	2.700	153.920	C.507	2.115	41.078	10.083 *	-56.029	12.870	9.174
	4730.C	15.06 *	6.713	4.935	69.927 *	38.486	2.724	163.780	C.505	1.986	41.080	5.349 *	-71.015	11.771	8.343
	4740.C	14.72 *	6.711	4.931	69.888 *	38.369	2.731	173.640	C.504	1.851	41.080	0.653 *	-87.631	11.317	8.009
	4750.C	14.51 *	6.711	4.932	70.007 *	38.288	2.722	183.500	C.505	C.555	41.075	-4.011 *	255.623	11.571	8.195
	4760.C	15.55 *	6.714	4.945	70.259 *	38.270	2.697	193.360	C.506	C.576	41.078	-8.651 *	240.319	12.477	8.873
	4770.C	16.70 *	6.719	4.968	70.664 *	38.280	2.655	203.220	C.505	C.545	41.075	-13.273 *	227.268	13.897	9.977
	4780.C	18.15 *	6.727	5.000	71.210 *	38.323	2.597	213.080	C.512	C.501	41.071	-17.885 *	216.451	15.681	11.423
* * * * *															
465E	4730.C	19.63 *	6.735	5.037	71.789 *	38.390	2.535	129.915	C.517	2.431	41.067	21.876 *	-28.553	17.427	12.890
15C	4740.C	17.86 *	6.724	4.987	71.303 *	37.988	2.598	139.779	C.512	2.308	41.071	17.033 *	-38.296	15.329	11.133
	4750.C	16.41 *	6.715	4.950	70.932 *	37.699	2.645	149.639	C.506	2.181	41.074	12.237 *	-49.987	13.541	9.695
	4760.C	15.37 *	6.710	4.925	70.688 *	37.495	2.676	159.495	C.506	2.050	41.076	7.487 *	-63.965	12.194	8.658
	4770.C	14.80 *	6.707	4.912	70.585 *	37.357	2.691	169.359	C.504	1.915	41.077	2.775 *	-79.982	11.433	8.094
	4780.C	14.75 *	6.706	4.905	70.627 *	37.267	2.689	179.215	C.504	C.595	41.077	-1.502 *	263.111	11.367	8.045
	4790.C	15.21 *	6.708	4.917	70.825 *	37.203	2.671	189.079	C.505	C.586	41.076	-6.551 *	246.996	11.991	8.507
	4800.C	16.14 *	6.712	4.935	71.156 *	37.193	2.637	198.939	C.507	C.560	41.074	-11.181 *	232.882	13.198	9.428
	4810.C	17.45 *	6.719	4.964	71.634 *	37.206	2.587	208.795	C.511	C.522	41.071	-15.798 *	221.085	14.835	10.730
	4820.C	18.06 *	6.728	5.003	72.245 *	37.249	2.521	218.659	C.515	C.672	41.067	-20.412 *	211.328	16.767	12.331
* * * * *															
470E	4780.C	19.55 *	6.725	5.008	72.749 *	36.746	2.482	130.506	C.517	2.432	41.064	21.702 *	-28.903	17.345	12.821
10C	4790.C	17.79 *	6.717	4.958	72.275 *	36.380	2.545	140.366	C.512	2.305	41.068	16.865 *	-38.659	15.258	11.075
	4800.C	16.36 *	6.709	4.921	71.913 *	36.118	2.592	150.226	C.508	2.181	41.071	12.076 *	-50.416	13.484	9.651
	4810.C	15.33 *	6.703	4.896	71.677 *	35.932	2.623	160.086	C.505	2.045	41.073	7.329 *	-64.464	12.155	8.629
	4820.C	14.78 *	6.700	4.883	71.580 *	35.802	2.637	169.946	C.504	1.915	41.074	2.621 *	-80.531	11.416	8.082
	4830.C	14.75 *	6.695	4.880	71.627 *	35.712	2.635	179.806	C.504	C.595	41.074	-2.055 *	262.561	11.373	8.050
	4840.C	15.23 *	6.701	4.885	71.820 *	35.652	2.617	189.666	C.505	C.586	41.072	-6.704 *	246.490	12.019	8.528
	4850.C	16.17 *	6.706	4.908	72.164 *	35.606	2.582	199.526	C.507	C.595	41.070	-11.333 *	232.450	13.243	9.462
	4860.C	17.45 *	6.713	4.938	72.637 *	35.598	2.532	209.386	C.511	C.521	41.067	-15.953 *	220.719	14.893	10.777
	4870.C	19.11 *	6.722	4.975	73.243 *	35.610	2.465	219.246	C.515	C.671	41.063	-20.570 *	211.017	16.835	12.388
* * * * *															
475E	4830.C	19.47 *	6.722	4.980	73.701 *	35.066	2.433	131.093	C.516	2.434	41.061	21.527 *	-29.219	17.263	12.751
5C	4840.C	17.73 *	6.711	4.930	73.238 *	34.738	2.495	140.953	C.511	2.310	41.065	16.696 *	-39.029	15.187	11.017
	4850.C	16.21 *	6.702	4.892	72.886 *	34.504	2.542	150.813	C.507	2.182	41.068	11.912 *	-50.854	13.427	9.606
	4860.C	15.30 *	6.697	4.868	72.659 *	34.337	2.573	160.673	C.505	2.045	41.070	7.170 *	-64.973	12.116	8.600
	4870.C	14.76 *	6.694	4.855	72.567 *	34.215	2.587	170.533	C.503	1.914	41.071	2.464 *	-81.089	11.400	8.070
	4880.C	14.75 *	6.693	4.854	72.619 *	34.125	2.585	180.393	C.503	C.598	41.071	-2.209 *	262.003	11.381	8.056
	4890.C	15.24 *	6.695	4.863	72.815 *	34.055	2.566	190.252	C.505	C.585	41.069	-6.858 *	245.981	12.045	8.550
	4900.C	16.20 *	6.700	4.882	73.154 *	33.999	2.531	200.113	C.507	C.586	41.067	-11.489 *	232.011	13.290	9.499
	4910.C	17.53 *	6.707	4.914	73.635 *	33.948	2.479	209.973	C.511	C.515	41.064	-16.111 *	220.352	14.952	10.825
	4920.C	19.16 *	6.717	4.956	74.234 *	33.925	2.413	219.833	C.515	C.665	41.060	-20.732 *	210.703	16.904	12.447
* * * * *															
480E	4880.C	19.40 *	6.716	4.955	74.645 *	33.350	2.387	131.680	C.516	2.435	41.055	21.350 *	-29.540	17.181	12.681
C	4890.C	17.66 *	6.705	4.905	74.193 *	33.064	2.449	141.540	C.511	2.311	41.062	16.526 *	-39.406	15.116	10.959
	4900.C	16.26 *	6.696	4.868	73.851 *	32.859	2.495	151.400	C.507	2.182	41.065	11.746 *	-51.300	13.371	9.562
	4910.C	15.26 *	6.691	4.842	73.632 *	32.711	2.552	161.260	C.504	2.045	41.067	7.008 *	-65.491	12.078	8.572
	4920.C	14.75 *	6.688	4.830	73.547 *	32.598	2.539	171.120	C.503	1.913	41.068	2.306 *	-81.656	11.385	8.059
	4930.C	14.75 *	6.688	4.825	73.603 *	32.507	2.537	180.980	C.502	C.598	41.068	-2.366 *	261.438	11.389	8.062
	4940.C	15.26 *	6.690	4.835	73.801 *	32.426	2.517	190.840	C.504	C.584	41.066	-7.015 *	245.468	12.079	8.573
	4950.C	16.23 *	6.695	4.860	74.141 *	32.350	2.482	200.700	C.507	C.557	41.064	-11.647 *	231.570	13.338	9.536
	4960.C	17.58 *	6.702	4.892	74.615 *	32.276	2.430	210.560	C.510	C.518	41.061	-16.271 *	219.579	15.014	10.875
	4970.C	19.22 *	6.712	4.935	75.219 *	32.196	2.363	220.420	C.515	C.667	41.057	-20.895 *	210.388	16.975	12.507
* * * * *															
ECATE	TTIME	DV SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1

ECATE	TTIME	CV	SUM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	DV1
4E53	4920.C	21.20	*	*	6.726	4.955	76.109	*	31.946	2.266	122.407	C.521	2.556	41.052	26.036	*	-21.549	19.373	14.574
315	4930.C	19.32	*	*	6.711	4.931	75.580	*	31.601	2.343	132.267	C.515	2.436	41.056	21.172	*	-29.866	17.099	12.611
	4940.C	17.60	*	*	6.699	4.881	75.140	*	31.359	2.405	142.127	C.510	2.311	41.060	16.353	*	-39.789	15.045	10.901
	4950.C	16.21	*	*	6.691	4.844	74.808	*	31.185	2.451	151.987	C.507	2.182	41.062	11.579	*	-51.754	13.314	9.518
	4960.C	15.23	*	*	6.686	4.819	74.597	*	31.056	2.481	161.847	C.504	2.048	41.064	6.845	*	-66.018	12.041	8.544
	4970.C	14.72	*	*	6.683	4.807	74.518	*	30.953	2.495	171.707	C.503	1.911	41.065	2.145	*	-82.232	11.370	8.048
	4980.C	14.75	*	*	6.683	4.806	74.578	*	30.860	2.491	181.567	C.502	C.558	41.065	-2.526	*	260.865	11.399	8.069
	4990.C	15.28	*	*	6.685	4.816	74.779	*	30.767	2.472	191.427	C.504	C.584	41.064	-7.174	*	244.949	12.111	8.597
	5000.C	16.27	*	*	6.690	4.838	75.119	*	30.669	2.436	201.287	C.507	C.956	41.061	-11.808	*	231.126	13.388	9.575
	5010.C	17.62	*	*	6.697	4.872	75.591	*	30.562	2.384	211.147	C.510	C.516	41.058	-16.434	*	219.605	15.076	10.926
4503	4970.C	21.21	*	*	6.720	4.973	77.022	*	30.108	2.226	122.994	C.521	2.558	41.050	25.850	*	-21.837	19.282	14.494
265	4980.C	19.25	*	*	6.706	4.909	76.506	*	29.823	2.303	132.854	C.515	2.438	41.054	20.992	*	-30.198	17.016	12.541
	4990.C	17.54	*	*	6.694	4.859	76.078	*	29.625	2.365	142.714	C.510	2.312	41.057	16.180	*	-40.179	14.974	10.843
	5000.C	16.16	*	*	6.686	4.821	75.756	*	29.484	2.410	152.574	C.506	2.182	41.060	11.410	*	-52.217	13.258	9.474
	5010.C	15.20	*	*	6.681	4.797	75.553	*	29.375	2.440	162.434	C.504	2.047	41.062	6.679	*	-66.555	12.004	8.516
	5020.C	14.72	*	*	6.678	4.785	75.481	*	29.280	2.452	172.294	C.503	1.910	41.062	1.982	*	-82.816	11.357	8.038
	5030.C	14.76	*	*	6.678	4.785	75.545	*	29.185	2.449	182.154	C.503	C.598	41.062	-2.687	*	260.287	11.411	8.077
	5040.C	15.30	*	*	6.680	4.796	75.748	*	29.080	2.429	192.014	C.504	C.583	41.061	-7.335	*	244.426	12.145	8.622
	5050.C	16.30	*	*	6.686	4.819	76.087	*	28.958	2.393	201.874	C.507	C.555	41.059	-11.970	*	230.678	13.439	9.615
	5060.C	17.67	*	*	6.693	4.852	76.556	*	28.815	2.341	211.734	C.510	C.514	41.056	-16.599	*	219.228	15.141	10.979
4553	5020.C	21.13	*	*	6.716	4.952	77.925	*	28.241	2.189	123.581	C.520	2.560	41.048	25.662	*	-22.130	19.190	14.413
215	5030.C	19.17	*	*	6.701	4.888	77.423	*	28.017	2.266	133.441	C.515	2.439	41.052	20.811	*	-30.536	16.933	12.471
	5040.C	17.47	*	*	6.690	4.838	77.007	*	27.866	2.327	143.301	C.510	2.312	41.055	16.004	*	-40.577	14.903	10.785
	5050.C	16.11	*	*	6.681	4.801	76.695	*	27.758	2.372	153.161	C.506	2.181	41.058	11.239	*	-52.688	13.202	9.431
	5060.C	15.17	*	*	6.676	4.777	76.500	*	27.669	2.401	163.021	C.504	2.046	41.059	6.512	*	-67.101	11.966	8.489
	5070.C	14.70	*	*	6.673	4.765	76.434	*	27.583	2.414	172.881	C.502	1.909	41.060	1.817	*	-83.409	11.344	8.029
	5080.C	14.76	*	*	6.674	4.765	76.502	*	27.485	2.410	182.741	C.503	C.597	41.060	-2.851	*	259.702	11.423	8.087
	5090.C	15.32	*	*	6.676	4.777	76.707	*	27.366	2.390	192.601	C.504	C.582	41.059	-7.499	*	243.899	12.180	8.648
	5100.C	16.34	*	*	6.682	4.801	77.046	*	27.218	2.353	202.461	C.507	C.554	41.057	-12.135	*	230.228	13.491	9.656
	5110.C	17.72	*	*	6.689	4.837	77.512	*	27.038	2.301	212.321	C.510	C.512	41.054	-16.766	*	218.849	15.206	11.032
ECATE	TTIME	CV	SUM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	DV1

TABLE XIII. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 URANUS RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	CV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1
45EE 184	506C.C	20.C2 *	6.7C5	4.9C4	78.279 *	26.823	2.208	129.160	C.517	2.45E	41.045	22.983 *	-26.582	17.922	13.315	
	507C.C	18.2C *	6.692	4.847	77.829 *	26.680	2.276	139.020	C.512	2.273	41.052	18.160 *	-35.828	15.781	11.506	
	508C.C	16.67 *	6.682	4.804	77.473 *	26.582	2.32E	148.88C	C.5C7	2.244	41.055	13.379 *	-46.953	13.918	9.993	
	509C.C	15.53 *	6.675	4.773	77.227 *	26.506	2.365	158.74C	C.5C4	2.11C	41.057	8.637 *	-60.326	12.455	8.856	
	510C.C	14.84 *	6.671	4.756	77.104 *	26.430	2.385	168.600	C.5C3	1.974	41.058	3.930 *	-75.886	11.540	8.172	
	511C.C	14.67 *	6.670	4.751	77.111 *	26.341	2.38E	178.46C	C.5C2	1.C0C	41.059	-C.749 *	267.277	11.298	7.995	
	512C.C	15.01 *	6.672	4.758	77.253 *	26.227	2.375	188.320	C.5C3	C.591	41.058	-5.405 *	250.798	11.760	8.334	
	513C.C	15.83 *	6.676	4.777	77.529 *	26.078	2.346	198.180	C.5C5	C.5EE	41.056	-10.047 *	236.095	12.840	9.150	
	514C.C	17.05 *	6.683	4.807	77.934 *	25.891	2.301	208.040	C.5CE	C.522	41.054	-14.681 *	223.702	14.392	10.372	
515C.C	18.61 *	6.692	4.85C	78.460 *	25.661	2.241	217.900	C.512	C.5EE	41.05C	-19.315 *	213.448	16.273	11.916		
5C2E 15C	505C.C	20.51 *	6.7C5	4.523	79.138 *	25.593	2.147	124.879	C.52C	2.55E	41.045	25.161 *	-22.926	18.948	14.202	
	510C.C	18.5E *	6.695	4.86C	78.660 *	25.462	2.223	134.739	C.514	2.434	41.049	20.321 *	-31.467	16.713	12.285	
	511C.C	17.31 *	6.683	4.81C	78.265 *	25.379	2.282	144.59E	C.5C5	2.3C6	41.053	15.524 *	-41.686	14.713	10.631	
	512C.C	15.99 *	6.675	4.774	77.972 *	25.319	2.326	154.459	C.5C5	2.174	41.055	1C.767 *	-54.014	13.053	9.315	
	513C.C	15.05 *	6.67C	4.75C	77.795 *	25.259	2.353	164.31E	C.5C2	2.C2E	41.057	6.C47 *	-68.640	11.874	8.419	
	514C.C	14.6E *	6.668	4.74C	77.744 *	25.184	2.365	174.179	C.5C2	1.895	41.057	1.356 *	-85.074	11.318	8.010	
	515C.C	14.75 *	6.668	4.741	77.824 *	25.079	2.359	184.039	C.5C2	C.596	41.057	-3.309 *	258.071	11.466	8.118	
	516C.C	15.40 *	6.671	4.755	78.C37 *	24.937	2.338	193.899	C.5C4	C.5EC	41.056	-7.957 *	242.441	12.284	8.727	
	517C.C	16.45 *	6.677	4.781	78.381 *	24.748	2.300	203.75E	C.507	C.55C	41.054	-12.595 *	228.994	13.643	9.776	
518C.C	17.87 *	6.685	4.81E	78.848 *	24.509	2.246	213.619	C.511	C.5CE	41.051	-17.230 *	217.820	15.393	11.185		
5C1E 10C	514C.C	2C.83 *	6.705	4.9C6	80.018 *	23.673	2.118	125.466	C.515	2.557	41.044	24.971 *	-23.230	18.855	14.122	
	515C.C	18.91 *	6.691	4.843	79.554 *	23.606	2.193	135.326	C.512	2.434	41.048	20.137 *	-31.820	16.631	12.216	
	516C.C	17.25 *	6.680	4.793	79.171 *	23.573	2.252	145.186	C.5C5	2.3C6	41.051	15.346 *	-42.1C3	14.642	10.574	
	517C.C	15.54 *	6.672	4.757	78.889 *	23.546	2.295	155.046	C.5C5	2.173	41.053	10.593 *	-54.5C8	12.999	9.273	
	518C.C	15.06 *	6.667	4.734	78.719 *	23.507	2.322	164.906	C.5C2	2.C37	41.055	5.875 *	-69.210	11.840	8.394	
	519C.C	14.67 *	6.664	4.724	78.674 *	23.438	2.332	174.766	C.5C2	1.89E	41.055	1.187 *	-85.686	11.309	8.003	
	520C.C	14.8C *	6.665	4.72E	7E.758 *	23.329	2.327	184.626	C.5C2	C.596	41.055	-3.478 *	257.474	11.483	8.130	
	521C.C	15.42 *	6.668	4.74C	78.972 *	23.169	2.305	194.486	C.5C4	C.575	41.054	-8.126 *	241.909	12.323	8.756	
	522C.C	16.49 *	6.674	4.767	79.315 *	22.951	2.267	204.346	C.5C7	C.945	41.052	-12.765 *	228.542	13.700	9.820	
523C.C	17.53 *	6.683	4.80E	79.778 *	22.668	2.213	214.206	C.511	C.5C6	41.049	-17.403 *	217.439	15.462	11.243		
512E 5C	515C.C	2C.74 *	6.7C2	4.851	80.888 *	21.736	2.091	126.053	C.515	2.55E	41.042	24.779 *	-23.539	18.763	14.042	
	520C.C	18.83 *	6.687	4.827	80.438 *	21.736	2.165	135.913	C.513	2.435	41.046	19.952 *	-32.178	16.548	12.146	
	521C.C	17.15 *	6.676	4.77E	8C.067 *	21.751	2.224	145.773	C.50E	2.3C6	41.049	15.165 *	-42.527	14.572	10.517	
	522C.C	15.9C *	6.668	4.742	79.795 *	21.758	2.266	155.633	C.5C5	2.173	41.052	1C.417 *	-55.011	12.945	9.231	
	523C.C	15.03 *	6.663	4.71E	79.633 *	21.739	2.293	165.493	C.5C2	2.C2E	41.053	5.702 *	-69.789	11.807	8.369	
	524C.C	14.66 *	6.661	4.705	79.594 *	21.678	2.303	175.353	C.5C2	1.89E	41.054	1.016 *	-86.306	11.301	7.997	
	525C.C	14.81 *	6.662	4.712	79.681 *	21.563	2.297	185.213	C.5C2	C.596	41.053	-3.648 *	256.873	11.501	8.143	
	526C.C	15.45 *	6.665	4.727	79.896 *	21.384	2.274	195.073	C.5C4	C.57E	41.052	-8.296 *	241.374	12.364	8.787	
	527C.C	16.54 *	6.671	4.755	8C.237 *	21.134	2.236	204.933	C.5C7	C.547	41.05C	-12.937 *	228.087	13.758	9.866	
528C.C	17.58 *	6.680	4.755	8C.696 *	20.806	2.182	214.793	C.511	C.5C4	41.047	-17.578 *	217.057	15.533	11.301		
517E C	524C.C	20.6E *	6.658	4.87E	81.748 *	19.786	2.068	126.640	C.515	2.55E	41.041	24.587 *	-23.852	18.671	13.961	
	525C.C	18.7E *	6.684	4.813	81.313 *	19.848	2.141	136.500	C.512	2.435	41.045	19.766 *	-32.541	16.465	12.077	
	526C.C	17.13 *	6.673	4.764	8C.953 *	19.918	2.199	146.360	C.5CE	2.3C6	41.048	14.984 *	-42.958	14.502	1C.460	
	527C.C	15.85 *	6.665	4.728	80.690 *	19.959	2.241	156.220	C.5C5	2.172	41.05C	10.240 *	-55.522	12.891	9.189	
	528C.C	15.01 *	6.66C	4.7C5	8C.537 *	19.959	2.266	166.080	C.5C2	2.C24	41.052	5.528 *	-70.376	11.775	8.345	
	529C.C	14.65 *	6.658	4.696	8C.503 *	19.905	2.276	175.940	C.5C2	1.894	41.052	0.843 *	-86.933	11.294	7.992	
	530C.C	14.82 *	6.655	4.655	8C.593 *	19.783	2.269	185.800	C.5C2	C.595	41.052	-3.820 *	256.267	11.520	8.158	
	531C.C	15.48 *	6.663	4.715	8C.809 *	19.585	2.247	195.66C	C.5C4	C.577	41.051	-8.469 *	240.835	12.406	8.819	
	532C.C	16.5E *	6.665	4.744	81.148 *	19.302	2.208	205.520	C.5C7	C.54E	41.045	-13.111 *	227.631	13.817	9.913	
533C.C	18.04 *	6.678	4.7E5	81.603 *	18.926	2.154	215.380	C.511	C.5C2	41.046	-17.755 *	216.673	15.606	11.361		
ECATE	TTIME	CV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	CV1

ECATE	TTIME	DV	SLM *	DV2	VINF2	PHI2 *	ALFFA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1		
			*			*							*					
			*			*							*					
5223	5250.C	20.58	*	6.656	4.864	82.597	*	17.828	2.047	127.227	C.518	2.560	41.040	24.393	*	-24.169	18.578	13.881
219	5300.C	18.65	*	6.681	4.800	82.174	*	17.964	2.119	137.087	C.512	2.435	41.044	19.578	*	-32.911	16.382	12.007
	5310.C	17.07	*	6.670	4.751	81.828	*	18.078	2.176	146.947	C.508	2.305	41.047	14.801	*	-43.396	14.431	10.403
	5320.C	15.61	*	6.663	4.715	81.575	*	18.152	2.217	156.807	C.504	2.171	41.049	10.061	*	-56.041	12.837	9.148
	5330.C	14.98	*	6.658	4.653	81.430	*	18.171	2.243	166.667	C.502	2.023	41.050	5.352	*	-70.971	11.743	8.322
	5340.C	14.64	*	6.656	4.684	81.401	*	18.122	2.252	176.527	C.501	1.852	41.051	0.665	*	-87.567	11.288	7.988
	5350.C	14.83	*	6.657	4.688	81.495	*	17.994	2.245	186.387	C.502	C.595	41.051	-3.994	*	255.656	11.541	8.173
	5360.C	15.51	*	6.660	4.705	81.711	*	17.775	2.222	196.247	C.504	C.576	41.049	-8.643	*	240.295	12.449	8.852
	5370.C	16.63	*	6.667	4.734	82.048	*	17.458	2.183	206.107	C.507	C.544	41.047	-13.287	*	227.173	13.878	9.962
	5380.C	18.10	*	6.676	4.777	82.497	*	17.033	2.129	215.967	C.511	C.501	41.044	-17.934	*	216.289	15.680	11.422
			*			*							*					
5273	5340.C	20.45	*	6.653	4.852	83.436	*	15.867	2.029	127.814	C.518	2.561	41.035	24.195	*	-24.490	18.485	13.800
269	5350.C	18.62	*	6.679	4.785	83.026	*	16.071	2.100	137.674	C.512	2.435	41.043	19.389	*	-33.286	16.299	11.937
	5360.C	17.01	*	6.668	4.735	82.692	*	16.233	2.157	147.534	C.508	2.305	41.046	14.617	*	-43.841	14.361	10.347
	5370.C	15.77	*	6.660	4.704	82.450	*	16.341	2.197	157.394	C.504	2.170	41.048	9.880	*	-56.569	12.784	9.108
	5380.C	14.95	*	6.655	4.682	82.312	*	16.378	2.221	167.254	C.502	2.021	41.045	5.174	*	-71.575	11.712	8.299
	5390.C	14.64	*	6.653	4.674	82.288	*	16.334	2.230	177.114	C.501	1.855	41.050	0.493	*	-88.207	11.284	7.985
	5400.C	14.84	*	6.654	4.678	82.385	*	16.197	2.223	186.974	C.502	C.594	41.045	-4.169	*	255.041	11.562	8.189
	5410.C	15.54	*	6.658	4.656	82.602	*	15.958	2.199	196.834	C.504	C.575	41.048	-8.820	*	239.751	12.494	8.885
	5420.C	16.68	*	6.665	4.726	82.936	*	15.605	2.161	206.694	C.507	C.543	41.046	-13.466	*	226.713	13.940	10.011
	5430.C	18.16	*	6.675	4.770	83.380	*	15.130	2.107	216.554	C.511	C.595	41.043	-18.115	*	215.902	15.755	11.484
			*			*							*					
5323	5350.C	20.41	*	6.651	4.841	84.263	*	13.907	2.013	128.401	C.518	2.561	41.035	24.004	*	-24.816	18.393	13.720
219	5400.C	18.54	*	6.676	4.778	83.867	*	14.178	2.084	138.261	C.512	2.435	41.042	19.199	*	-33.666	16.216	11.868
	5410.C	16.96	*	6.666	4.725	83.541	*	14.399	2.139	148.121	C.507	2.304	41.045	14.431	*	-44.294	14.291	10.291
	5420.C	15.73	*	6.658	4.694	83.313	*	14.528	2.179	157.981	C.504	2.168	41.047	9.698	*	-57.104	12.732	9.067
	5430.C	14.93	*	6.653	4.673	83.183	*	14.584	2.203	167.841	C.502	2.025	41.048	4.995	*	-72.187	11.682	8.277
	5440.C	14.63	*	6.651	4.665	83.165	*	14.544	2.211	177.701	C.501	1.887	41.045	0.315	*	-88.854	11.280	7.983
	5450.C	14.86	*	6.653	4.670	83.264	*	14.398	2.203	187.561	C.502	C.594	41.048	-4.347	*	254.422	11.586	8.206
	5460.C	15.56	*	6.657	4.688	83.481	*	14.136	2.180	197.421	C.504	C.574	41.047	-8.998	*	239.206	12.540	8.921
	5470.C	16.72	*	6.663	4.720	83.812	*	13.747	2.141	207.281	C.507	C.541	41.045	-13.646	*	226.253	14.004	10.061
	5480.C	18.22	*	6.673	4.764	84.251	*	13.220	2.087	217.141	C.511	C.597	41.042	-18.299	*	215.515	15.831	11.548
			*			*							*					
ECATE	TTIME	DV	SLM *	DV2	VINF2	PHI2 *	ALFFA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1		

TABLE XIII. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 URANUS RADII CIRCULAR PARKING ORBIT

ECATE	TIME	DV SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1
5357	5420.C	21.32 *	6.657	4.870	85.037 *	12.375	1.966	124.120	0.520	2.620	41.036	26.164 *	-21.318	19.424	14.618
164	5430.C	19.35 *	6.681	4.800	84.622 *	12.722	2.043	133.980	0.514	2.456	41.040	21.344 *	-29.511	17.164	12.667
	5440.C	17.63 *	6.665	4.744	84.271 *	13.003	2.105	143.840	0.505	2.267	41.042	16.563 *	-39.282	15.115	10.958
	5450.C	16.23 *	6.660	4.703	84.002 *	13.205	2.151	153.700	0.505	2.222	41.046	11.817 *	-51.069	13.376	9.566
	5460.C	15.23 *	6.654	4.675	83.828 *	13.318	2.182	163.560	0.503	2.054	41.047	7.102 *	-65.159	12.080	8.573
	5470.C	14.70 *	6.651	4.661	83.760 *	13.331	2.197	173.420	0.501	1.953	41.048	2.413 *	-81.261	11.374	8.050
	5480.C	14.65 *	6.651	4.660	83.805 *	13.235	2.197	183.280	0.501	0.956	41.048	-2.256 *	261.823	11.362	8.042
	5490.C	15.20 *	6.653	4.673	83.567 *	13.018	2.180	193.140	0.502	0.988	41.047	-6.912 *	245.776	12.039	8.542
	5500.C	16.16 *	6.655	4.695	84.244 *	12.669	2.149	203.000	0.505	0.956	41.045	-11.561 *	231.771	13.293	9.502
	5510.C	17.51 *	6.667	4.738	84.630 *	12.178	2.102	212.860	0.505	0.918	41.042	-16.212 *	220.074	14.975	10.844
5352	5460.C	20.20 *	6.687	4.825	85.376 *	11.213	2.000	129.695	0.517	2.556	41.038	23.494 *	-25.678	18.153	13.513
150	5470.C	18.36 *	6.673	4.763	85.002 *	11.571	2.069	139.559	0.511	2.428	41.041	18.699 *	-34.683	16.001	11.688
	5480.C	16.81 *	6.662	4.715	84.700 *	11.844	2.122	149.419	0.507	2.256	41.044	13.935 *	-45.511	14.109	10.145
	5490.C	15.62 *	6.655	4.681	84.486 *	12.021	2.160	159.279	0.504	2.155	41.046	9.212 *	-58.555	12.506	8.964
	5500.C	14.87 *	6.651	4.661	84.372 *	12.094	2.182	169.135	0.502	2.015	41.047	4.513 *	-73.844	11.608	8.222
	5510.C	14.63 *	6.645	4.654	84.366 *	12.053	2.188	178.995	0.501	1.000	41.048	-0.163 *	269.406	11.278	7.981
	5520.C	14.91 *	6.651	4.661	84.474 *	11.886	2.179	188.859	0.502	0.953	41.047	-4.824 *	252.770	11.655	8.257
	5530.C	15.67 *	6.655	4.681	84.697 *	11.585	2.155	198.719	0.504	0.971	41.046	-9.476 *	237.762	12.668	9.019
	5540.C	16.86 *	6.662	4.714	85.029 *	11.137	2.115	208.579	0.507	0.937	41.044	-14.127 *	225.041	14.178	10.200
	5550.C	18.25 *	6.673	4.761	85.464 *	10.529	2.060	218.435	0.511	0.851	41.041	-18.785 *	214.505	16.037	11.719
5442	5510.C	20.12 *	6.685	4.817	86.179 *	9.278	1.991	130.286	0.517	2.556	41.037	23.297 *	-26.016	18.060	13.433
100	5520.C	18.27 *	6.671	4.755	85.818 *	9.700	2.058	140.146	0.511	2.428	41.041	18.506 *	-35.080	15.918	11.620
	5530.C	16.75 *	6.661	4.707	85.527 *	10.017	2.111	150.006	0.507	2.255	41.043	13.751 *	-45.983	14.040	10.091
	5540.C	15.58 *	6.653	4.674	85.323 *	10.223	2.147	159.866	0.504	2.156	41.045	9.027 *	-59.114	12.546	8.925
	5550.C	14.65 *	6.645	4.654	85.216 *	10.310	2.169	169.726	0.502	2.017	41.047	4.331 *	-74.477	11.582	8.203
	5560.C	14.62 *	6.648	4.648	85.215 *	10.270	2.175	179.586	0.501	0.904	41.047	-0.345 *	268.744	11.279	7.981
	5570.C	14.93 *	6.645	4.655	85.325 *	10.092	2.165	189.446	0.502	0.992	41.046	-5.006 *	252.146	11.682	8.277
	5580.C	15.71 *	6.654	4.676	85.547 *	9.766	2.140	199.306	0.504	0.970	41.045	-9.659 *	237.217	12.719	9.057
	5590.C	16.52 *	6.661	4.710	85.876 *	9.279	2.101	209.166	0.507	0.936	41.042	-14.312 *	224.583	14.245	10.254
	5600.C	18.46 *	6.672	4.756	86.305 *	8.618	2.046	219.026	0.511	0.855	41.040	-18.973 *	214.119	16.117	11.785
5452	5560.C	20.04 *	6.684	4.810	86.971 *	7.361	1.984	130.873	0.516	2.556	41.037	23.098 *	-26.358	17.967	13.353
50	5570.C	18.22 *	6.670	4.745	86.622 *	7.842	2.050	140.733	0.511	2.428	41.040	18.313 *	-35.482	15.836	11.551
	5580.C	16.70 *	6.655	4.701	86.343 *	8.203	2.102	150.592	0.506	2.254	41.042	13.562 *	-46.463	13.972	10.036
	5590.C	15.54 *	6.652	4.668	86.148 *	8.436	2.137	160.453	0.502	2.156	41.045	8.841 *	-59.681	12.496	8.887
	5600.C	14.83 *	6.648	4.646	86.048 *	8.536	2.158	170.312	0.502	2.015	41.046	4.146 *	-75.118	11.556	8.184
	5610.C	14.63 *	6.647	4.643	86.052 *	8.496	2.163	180.172	0.501	1.000	41.046	-0.528 *	268.078	11.281	7.983
	5620.C	14.55 *	6.648	4.651	86.164 *	8.306	2.154	190.033	0.502	0.951	41.046	-5.189 *	251.520	11.711	8.299
	5630.C	15.75 *	6.653	4.673	86.385 *	7.955	2.129	195.893	0.504	0.969	41.044	-9.843 *	236.671	12.770	9.097
	5640.C	16.57 *	6.661	4.708	86.711 *	7.429	2.089	209.752	0.507	0.934	41.042	-14.498 *	224.123	14.314	10.309
	5650.C	18.53 *	6.672	4.757	87.133 *	6.714	2.035	219.613	0.512	0.857	41.040	-19.163 *	213.733	16.199	11.853
5542	5610.C	19.56 *	6.682	4.804	87.751 *	5.465	1.980	131.460	0.516	2.556	41.037	22.859 *	-26.705	17.874	13.273
50	5620.C	18.15 *	6.665	4.743	87.416 *	6.003	2.045	141.320	0.511	2.427	41.040	18.118 *	-35.890	15.753	11.483
	5630.C	16.64 *	6.656	4.696	87.148 *	6.404	2.095	151.180	0.506	2.252	41.042	13.371 *	-46.944	13.904	9.982
	5640.C	15.50 *	6.651	4.663	86.962 *	6.664	2.130	161.040	0.502	2.154	41.044	8.653 *	-60.256	12.447	8.850
	5650.C	14.81 *	6.647	4.644	86.869 *	6.776	2.150	170.900	0.501	2.012	41.046	3.961 *	-75.767	11.531	8.166
	5660.C	14.63 *	6.646	4.635	86.878 *	6.735	2.155	180.760	0.501	1.000	41.046	-0.713 *	267.406	11.284	7.985
	5670.C	14.57 *	6.648	4.648	86.991 *	6.532	2.144	190.620	0.502	0.951	41.045	-5.374 *	250.890	11.742	8.321
	5680.C	15.75 *	6.653	4.670	87.211 *	6.155	2.119	200.480	0.504	0.966	41.044	-10.029 *	236.124	12.823	9.138
	5690.C	17.03 *	6.661	4.706	87.533 *	5.590	2.080	210.340	0.507	0.932	41.042	-14.687 *	223.663	14.384	10.365
	5700.C	18.55 *	6.671	4.756	87.948 *	4.821	2.026	220.200	0.512	0.855	41.035	-19.355 *	213.346	16.281	11.923
ECATE	TIME	DV SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1

ECATE	TTIME	DV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1
*****																
5592	566C.C	19.87	*	6.681	4.795	88.520	*	3.593	1.978	132.047	C.516	2.556	41.037	22.699	*	-27.057
315	567C.C	18.08	*	6.668	4.738	88.198	*	4.186	2.041	141.907	C.510	2.426	41.040	17.922	*	-36.304
	568C.C	16.59	*	6.657	4.691	87.941	*	4.625	2.090	151.767	C.506	2.251	41.042	13.179	*	-47.443
	569C.C	15.46	*	6.650	4.655	87.764	*	4.909	2.124	161.627	C.503	2.152	41.044	8.464	*	-60.838
	570C.C	14.75	*	6.646	4.640	87.678	*	5.032	2.143	171.487	C.501	2.010	41.045	3.774	*	-76.423
	5710.C	14.63	*	6.645	4.636	87.691	*	4.989	2.148	181.347	C.501	1.000	41.045	-0.899	*	266.730
	5720.C	14.55	*	6.647	4.645	87.806	*	4.772	2.137	191.207	C.502	C.550	41.045	-5.560	*	250.259
	573C.C	15.83	*	6.652	4.665	88.025	*	4.369	2.112	201.067	C.504	C.567	41.044	-10.217	*	235.576
	574C.C	17.08	*	6.660	4.706	88.343	*	3.765	2.072	210.927	C.507	C.531	41.042	-14.877	*	223.202
	575C.C	18.66	*	6.672	4.756	88.751	*	2.943	2.019	220.787	C.512	C.663	41.035	-15.548	*	212.959
*****																
5642	571C.C	19.75	*	6.680	4.795	89.278	*	1.750	1.977	132.634	C.515	2.556	41.037	22.497	*	-27.413
269	5720.C	18.01	*	6.667	4.734	88.969	*	2.393	2.040	142.494	C.510	2.425	41.040	17.726	*	-36.723
	573C.C	16.53	*	6.656	4.688	88.723	*	2.868	2.088	152.354	C.506	2.290	41.042	12.986	*	-47.943
	5740.C	15.43	*	6.645	4.656	88.554	*	3.174	2.121	162.214	C.503	2.150	41.044	8.274	*	-61.429
	5750.C	14.78	*	6.646	4.638	88.468	*	3.323	2.139	172.074	C.501	2.007	41.045	3.584	*	-77.089
	5760.C	14.64	*	6.645	4.634	88.492	*	3.262	2.143	181.934	C.501	1.000	41.045	-1.087	*	266.048
	577C.C	15.02	*	6.647	4.644	88.609	*	3.030	2.132	191.794	C.502	C.585	41.045	-5.748	*	249.625
	578C.C	15.67	*	6.652	4.668	88.827	*	2.600	2.107	201.654	C.504	C.566	41.043	-10.406	*	235.027
	579C.C	17.14	*	6.660	4.706	89.140	*	1.958	2.067	211.514	C.508	C.525	41.041	-15.068	*	222.742
	580C.C	18.74	*	6.672	4.758	89.544	*	1.077	2.014	221.374	C.512	C.860	41.035	-15.743	*	212.572
*****																
5652	576C.C	19.71	*	6.680	4.792	90.028	*	-0.061	1.979	133.221	C.515	2.556	41.037	22.295	*	-27.773
219	577C.C	17.95	*	6.666	4.731	89.729	*	0.629	2.040	143.081	C.510	2.424	41.040	17.528	*	-37.148
	578C.C	16.48	*	6.656	4.685	89.494	*	1.137	2.087	152.941	C.506	2.288	41.042	12.792	*	-48.451
	5790.C	15.39	*	6.645	4.653	89.334	*	1.463	2.119	162.801	C.503	2.148	41.044	8.083	*	-62.027
	580C.C	14.76	*	6.645	4.636	89.260	*	1.605	2.137	172.661	C.501	2.004	41.045	3.396	*	-77.756
	5810.C	14.64	*	6.645	4.633	89.282	*	1.555	2.140	182.521	C.501	C.595	41.045	-1.276	*	265.362
	582C.C	15.04	*	6.647	4.643	89.400	*	1.309	2.129	192.381	C.502	C.585	41.044	-5.937	*	248.989
	5830.C	15.52	*	6.652	4.668	89.618	*	0.849	2.103	202.241	C.504	C.564	41.043	-10.597	*	234.479
	584C.C	17.20	*	6.661	4.707	89.877	*	0.279	2.064	212.101	C.508	C.527	41.041	-15.267	*	222.268
	585C.C	18.81	*	6.672	4.760	90.319	*	-0.754	2.011	221.961	C.512	C.876	41.038	-15.940	*	212.184
*****																
ECATE	TTIME	DV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1



TABLE XIII. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 URANUS RADII CIRCULAR PARKING ORBIT

ECATE	TIME	DV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL 2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1
5727 184	5750.C	20.58 *	6.687	4.824	90.691 *	-1.712	1.949	128.940	C.518	2.615	41.035	24.431 *	-24.097	18.593	13.893	
	5800.C	18.70 *	6.672	4.757	90.379 *	-0.894	2.015	138.800	C.512	2.467	41.035	19.651 *	-32.753	16.410	12.030	
	5810.C	17.09 *	6.660	4.704	90.203 *	-0.461	2.068	148.660	C.507	2.352	41.041	14.913 *	-43.115	14.469	10.434	
	5820.C	15.82 *	6.652	4.666	89.880 *	0.264	2.106	158.520	C.504	2.212	41.043	10.179 *	-55.686	12.866	9.171	
	5850.C	14.80 *	6.645	4.637	89.788 *	0.461	2.135	188.100	C.501	C.555	41.045	-3.863 *	256.108	11.518	8.156	
	5860.C	15.47 *	6.645	4.655	90.075 *	-0.165	2.116	197.960	C.503	C.577	41.044	-8.510 *	240.695	12.410	8.822	
	5870.C	16.58 *	6.657	4.688	90.307 *	-0.690	2.083	207.820	C.506	C.545	41.042	-13.177 *	227.448	13.835	9.927	
	5880.C	18.06 *	6.667	4.735	90.657 *	-1.528	2.037	217.680	C.510	C.501	41.040	-17.850 *	216.458	15.641	11.390	
5762 150	5830.C	19.51 *	6.678	4.786	91.031 *	-2.481	1.989	134.515	C.515	2.546	41.037	21.779 *	-28.706	17.360	12.833	
	5840.C	17.77 *	6.665	4.726	90.754 *	-1.741	2.047	144.379	C.509	2.416	41.040	17.019 *	-38.259	15.298	11.108	
	5850.C	16.34 *	6.655	4.681	90.537 *	-1.201	2.091	154.239	C.505	2.275	41.042	12.289 *	-49.784	13.530	9.687	
	5860.C	15.30 *	6.648	4.651	90.391 *	-0.857	2.121	164.099	C.502	2.136	41.044	7.585 *	-63.603	12.185	8.652	
	5870.C	14.72 *	6.645	4.635	90.332 *	-0.719	2.137	173.959	C.501	1.993	41.045	2.901 *	-79.514	11.413	8.079	
	5880.C	14.06 *	6.645	4.633	90.363 *	-0.786	2.139	183.815	C.501	C.595	41.045	-1.769 *	263.576	11.326	8.016	
	5890.C	15.11 *	6.647	4.645	90.486 *	-1.062	2.127	193.679	C.502	C.587	41.044	-6.431 *	247.346	11.937	8.466	
	5900.C	16.04 *	6.653	4.672	90.700 *	-1.557	2.100	203.535	C.505	C.561	41.043	-11.094 *	233.068	13.143	9.385	
5812 100	5910.C	17.36 *	6.662	4.713	91.009 *	-2.308	2.061	213.399	C.508	C.522	41.041	-15.763 *	221.105	14.796	10.698	
	5920.C	19.00 *	6.674	4.768	91.407 *	-3.343	2.008	223.259	C.512	C.872	41.038	-20.446 *	211.203	16.760	12.325	
	5880.C	19.42 *	6.678	4.784	91.745 *	-4.188	1.995	135.106	C.514	2.547	41.038	21.574 *	-29.082	17.267	12.754	
	5890.C	17.71 *	6.665	4.725	91.482 *	-3.415	2.052	144.966	C.509	2.415	41.040	16.819 *	-38.703	15.217	11.041	
	5900.C	16.25 *	6.655	4.680	91.279 *	-2.859	2.095	154.826	C.505	2.277	41.042	12.093 *	-50.314	13.465	9.636	
	5910.C	15.27 *	6.648	4.650	91.142 *	-2.502	2.124	164.686	C.503	2.135	41.044	7.391 *	-64.224	12.141	8.619	
	5920.C	14.71 *	6.645	4.635	91.089 *	-2.361	2.139	174.546	C.501	1.990	41.045	2.708 *	-80.202	11.395	8.066	
	5930.C	14.07 *	6.645	4.634	91.123 *	-2.432	2.140	184.406	C.501	C.595	41.045	-1.962 *	262.882	11.338	8.025	
5862 50	5940.C	15.14 *	6.648	4.647	91.249 *	-2.729	2.128	194.266	C.502	C.588	41.044	-6.624 *	246.712	11.976	8.495	
	5950.C	16.05 *	6.654	4.675	91.465 *	-3.260	2.102	204.126	C.505	C.560	41.043	-11.288 *	232.525	13.204	9.432	
	5960.C	17.42 *	6.663	4.717	91.767 *	-4.043	2.062	213.986	C.508	C.521	41.041	-15.960 *	220.650	14.873	10.761	
	5970.C	19.08 *	6.675	4.773	92.146 *	-5.101	2.010	223.846	C.512	C.870	41.038	-20.648 *	210.817	16.850	12.401	
	5930.C	19.35 *	6.678	4.784	92.462 *	-5.888	2.003	135.693	C.514	2.547	41.038	21.370 *	-29.459	17.175	12.676	
	5940.C	17.64 *	6.665	4.725	92.209 *	-5.077	2.058	145.553	C.509	2.413	41.041	16.619 *	-39.151	15.136	10.975	
	5950.C	16.24 *	6.655	4.681	92.012 *	-4.489	2.100	155.413	C.505	2.275	41.043	11.895 *	-50.850	13.400	9.585	
	5960.C	15.23 *	6.645	4.651	91.884 *	-4.120	2.128	165.273	C.502	2.133	41.044	7.195 *	-64.852	12.098	8.586	
5912 0	5970.C	14.70 *	6.645	4.636	91.835 *	-3.973	2.143	175.133	C.501	1.987	41.045	2.514 *	-80.897	11.379	8.054	
	5980.C	14.08 *	6.645	4.636	91.872 *	-4.051	2.144	184.993	C.501	C.595	41.045	-2.155 *	262.184	11.351	8.034	
	5990.C	15.17 *	6.648	4.650	91.998 *	-4.364	2.131	194.853	C.502	C.585	41.045	-6.819 *	246.075	12.017	8.526	
	6000.C	16.14 *	6.654	4.678	92.212 *	-4.922	2.105	204.713	C.505	C.558	41.043	-11.484 *	231.980	13.267	9.481	
	6010.C	17.45 *	6.664	4.721	92.509 *	-5.742	2.065	214.573	C.508	C.515	41.041	-16.158 *	220.194	14.952	10.825	
	6020.C	19.15 *	6.676	4.778	92.880 *	-6.847	2.014	224.433	C.514	C.867	41.039	-20.851 *	210.432	16.941	12.478	
	5960.C	19.27 *	6.678	4.784	93.161 *	-7.531	2.012	136.280	C.514	2.546	41.035	21.165 *	-29.842	17.082	12.597	
	5990.C	17.57 *	6.665	4.725	92.920 *	-6.690	2.066	146.140	C.509	2.412	41.041	16.417 *	-39.606	15.055	10.909	
6000.C	6000.C	16.15 *	6.655	4.682	92.733 *	-6.082	2.107	156.000	C.505	2.273	41.043	11.697 *	-51.394	13.335	9.534	
	6010.C	15.20 *	6.645	4.653	92.613 *	-5.703	2.134	165.860	C.502	2.130	41.045	6.999 *	-65.489	12.055	8.554	
	6020.C	14.05 *	6.646	4.638	92.569 *	-5.554	2.148	175.720	C.501	1.984	41.045	2.319 *	-81.597	11.364	8.043	
	6030.C	14.05 *	6.646	4.638	92.609 *	-5.640	2.148	185.580	C.501	C.598	41.045	-2.350 *	261.483	11.366	8.045	
	6040.C	15.21 *	6.645	4.653	92.735 *	-5.969	2.135	195.440	C.502	C.584	41.045	-7.015 *	245.438	12.059	8.557	
	6050.C	16.15 *	6.655	4.682	92.947 *	-6.554	2.109	205.300	C.505	C.557	41.043	-11.681 *	231.436	13.330	9.531	
	6060.C	17.56 *	6.665	4.726	93.238 *	-7.409	2.070	215.160	C.508	C.517	41.041	-16.359 *	219.738	15.032	10.890	
	6070.C	19.23 *	6.678	4.784	93.601 *	-8.559	2.019	225.020	C.514	C.865	41.035	-21.055 *	210.048	17.033	12.555	
ECATE	TIME	DV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1

ECATE	TIME	CV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMIC	VEL1	ALPHA1 *	PHI1	VINF1	DV1
			*			*							*			
			*			*							*			
5962	6020.C	21.13	*	6.694	4.857	94.117	* -10.255	1.958	127.007	C.520	2.674	41.036	25.732	* -21.996	19.215	14.435
319	6030.C	19.20	*	6.678	4.784	93.849	* -9.132	2.024	136.867	C.514	2.545	41.039	20.958	* -30.230	16.990	12.519
	6040.C	17.51	*	6.665	4.726	93.620	* -8.264	2.076	146.727	C.509	2.410	41.042	16.215	* -40.067	14.975	10.844
	6050.C	16.14	*	6.655	4.683	93.443	* -7.639	2.116	156.587	C.505	2.270	41.044	11.497	* -51.945	13.271	9.484
	6060.C	15.17	*	6.645	4.655	93.330	* -7.252	2.142	166.447	C.502	2.127	41.045	6.801	* -66.133	12.013	8.523
	6070.C	14.48	*	6.646	4.641	93.291	* -7.103	2.155	176.307	C.501	1.980	41.046	2.122	* -82.304	11.350	8.033
	6080.C	14.70	*	6.646	4.642	93.334	* -7.197	2.155	186.167	C.501	C.598	41.046	-2.547	* 260.780	11.382	8.057
	6090.C	15.24	*	6.650	4.657	93.460	* -7.543	2.141	196.027	C.503	C.582	41.045	-7.212	* 244.801	12.102	8.590
	6100.C	16.24	*	6.656	4.687	93.669	* -8.153	2.115	205.887	C.505	C.555	41.044	-11.880	* 230.892	13.396	9.581
	6110.C	17.42	*	6.666	4.732	93.956	* -9.044	2.077	215.747	C.509	C.515	41.042	-16.561	* 219.283	15.114	10.957
			*			*							*			
6012	6070.C	21.04	*	6.694	4.858	94.781	* -11.846	1.973	127.594	C.519	2.673	41.037	25.520	* -22.333	19.113	14.347
269	6080.C	19.12	*	6.678	4.786	94.527	* -10.691	2.036	137.454	C.514	2.542	41.040	20.751	* -30.623	16.897	12.441
	6090.C	17.44	*	6.665	4.728	94.308	* -9.799	2.087	147.314	C.509	2.408	41.042	16.011	* -40.534	14.895	10.778
	6100.C	16.09	*	6.656	4.685	94.141	* -9.159	2.125	157.174	C.505	2.268	41.044	11.296	* -52.503	13.208	9.435
	6110.C	15.14	*	6.650	4.657	94.035	* -8.766	2.151	167.034	C.502	2.124	41.046	6.603	* -66.784	11.973	8.493
	6120.C	14.67	*	6.647	4.644	94.002	* -8.618	2.163	176.894	C.501	1.977	41.046	1.925	* -83.016	11.337	8.024
	6130.C	14.72	*	6.647	4.646	94.047	* -8.721	2.162	186.754	C.501	C.558	41.046	-2.744	* 260.073	11.400	8.069
	6140.C	15.27	*	6.651	4.662	94.173	* -9.084	2.149	196.614	C.503	C.582	41.045	-7.410	* 244.163	12.147	8.623
	6150.C	16.25	*	6.658	4.682	94.380	* -9.720	2.123	206.474	C.505	C.554	41.044	-12.081	* 230.349	13.462	9.633
	6160.C	17.45	*	6.668	4.738	94.661	* -10.643	2.085	216.334	C.509	C.512	41.042	-16.764	* 218.829	15.196	11.024
			*			*							*			
6062	6120.C	20.05	*	6.695	4.855	95.436	* -13.388	1.988	128.181	C.519	2.672	41.037	25.308	* -22.673	19.012	14.258
219	6130.C	19.04	*	6.679	4.788	95.193	* -12.206	2.050	138.041	C.512	2.542	41.040	20.543	* -31.021	16.805	12.363
	6140.C	17.38	*	6.666	4.731	94.986	* -11.294	2.099	147.901	C.508	2.406	41.043	15.807	* -41.007	14.815	10.713
	6150.C	16.04	*	6.657	4.688	94.828	* -10.642	2.137	157.761	C.505	2.266	41.045	11.095	* -53.068	13.145	9.386
	6160.C	15.11	*	6.651	4.661	94.730	* -10.244	2.161	167.621	C.502	2.121	41.046	6.403	* -67.443	11.933	8.463
	6170.C	14.66	*	6.648	4.648	94.701	* -10.099	2.173	177.481	C.501	1.973	41.047	1.726	* -83.734	11.326	8.015
	6180.C	14.73	*	6.648	4.650	94.749	* -10.212	2.171	187.341	C.501	C.557	41.047	-2.943	* 259.364	11.419	8.083
	6190.C	15.31	*	6.652	4.667	94.875	* -10.592	2.158	197.201	C.503	C.582	41.046	-7.610	* 243.525	12.193	8.658
	6200.C	16.35	*	6.659	4.689	95.078	* -11.252	2.132	207.061	C.506	C.552	41.045	-12.283	* 229.806	13.530	9.687
	6210.C	17.74	*	6.669	4.746	95.353	* -12.208	2.094	216.921	C.510	C.511	41.043	-16.969	* 218.375	15.280	11.092
			*			*							*			
ECATE	TIME	CV	SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMIC	VEL1	ALPHA1 *	PHI1	VINF1	DV1

TABLE XIII. - Concluded. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 URANUS RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	CV	SLM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1
6C56	616C.C	19.87	*	6.686	4.821	95.759	* -13.768	2.033	133.760	C.516	2.6C4	41.04C	22.659	* -27.132	17.765	13.180
184	6170.C	18.08	*	6.672	4.758	95.541	* -12.715	2.087	143.620	C.511	2.47C	41.042	17.912	* -36.331	15.669	11.413
	618C.C	16.59	*	6.661	4.705	95.364	* -11.932	2.129	153.480	C.506	2.231	41.044	13.191	* -47.415	13.842	9.933
	619C.C	15.47	*	6.654	4.675	95.242	* -11.409	2.159	163.340	C.503	2.18E	41.046	8.492	* -60.756	12.407	8.820
	620C.C	14.8C	*	6.645	4.655	95.183	* -11.143	2.176	173.200	C.502	2.041	41.047	3.809	* -76.299	11.514	8.153
	621C.C	14.64	*	6.648	4.651	95.197	* -11.138	2.181	183.060	C.501	1.00C	41.047	-0.862	* 266.863	11.289	7.989
	622C.C	14.95	*	6.651	4.661	95.286	* -11.399	2.173	192.920	C.502	C.55C	41.047	-5.530	* 250.363	11.770	8.342
	623C.C	15.82	*	6.656	4.687	95.451	* -11.937	2.153	202.78C	C.504	C.567	41.046	-10.200	* 235.629	12.875	9.177
	624C.C	17.09	*	6.665	4.727	95.69C	* -12.770	2.120	212.640	C.50E	C.531	41.044	-14.881	* 223.198	14.459	10.426
	625C.C	18.6E	*	6.677	4.782	95.995	* -13.914	2.077	222.500	C.512	C.8E2	41.042	-15.580	* 212.902	16.381	12.006
			*				*							*		
6121	619C.C	20.72	*	6.654	4.855	96.317	* -15.388	2.015	129.479	C.515	2.6E5	41.039	24.778	* -23.533	18.760	14.039
15C	620C.C	18.85	*	6.679	4.788	96.093	* -14.187	2.074	139.339	C.512	2.534	41.042	20.021	* -32.033	16.575	12.168
	621C.C	17.22	*	6.666	4.733	95.902	* -13.267	2.121	149.199	C.50E	2.351	41.044	15.290	* -42.220	14.615	10.552
	622C.C	15.92	*	6.657	4.652	95.759	* -12.615	2.155	159.059	C.504	2.255	41.046	10.583	* -54.523	12.989	9.265
	623C.C	15.04	*	6.652	4.666	95.673	* -12.226	2.178	168.919	C.502	2.105	41.047	5.894	* -69.136	11.836	8.391
	624C.C	14.65	*	6.645	4.655	95.655	* -12.100	2.188	178.779	C.501	1.561	41.048	1.219	* -85.569	11.302	7.998
	625C.C	14.77	*	6.650	4.659	95.709	* -12.241	2.186	188.635	C.502	C.556	41.047	-3.450	* 257.566	11.472	8.122
	626C.C	15.40	*	6.654	4.677	95.838	* -12.657	2.171	198.499	C.503	C.575	41.047	-8.119	* 241.919	12.315	8.750
	627C.C	16.45	*	6.662	4.711	96.040	* -13.364	2.145	208.359	C.506	C.54E	41.045	-12.795	* 228.449	13.704	9.824
	628C.C	17.94	*	6.672	4.76C	96.311	* -14.379	2.107	218.219	C.51C	C.505	41.043	-17.487	* 217.245	15.492	11.267
			*				*							*		
61E1	624C.C	20.65	*	6.655	4.861	96.948	* -16.815	2.033	130.066	C.51E	2.6E4	41.04C	24.565	* -23.885	18.659	13.951
10C	625C.C	18.77	*	6.679	4.792	96.735	* -15.597	2.090	139.926	C.513	2.532	41.042	19.811	* -32.446	16.483	12.092
	626C.C	17.1E	*	6.667	4.736	96.554	* -14.665	2.136	149.786	C.50E	2.254	41.045	15.084	* -42.712	14.537	10.488
	627C.C	15.8E	*	6.658	4.656	96.419	* -14.007	2.169	159.646	C.504	2.252	41.047	10.379	* -55.111	12.929	9.219
	628C.C	15.02	*	6.653	4.671	96.341	* -13.618	2.191	169.506	C.502	2.106	41.048	5.692	* -69.817	11.800	8.364
	629C.C	14.64	*	6.651	4.660	96.327	* -13.497	2.200	179.366	C.501	1.557	41.048	1.017	* -86.301	11.295	7.993
	630C.C	14.75	*	6.652	4.665	96.383	* -13.649	2.198	189.226	C.502	C.556	41.048	-3.652	* 256.855	11.496	8.140
	631C.C	15.44	*	6.656	4.684	96.511	* -14.083	2.183	199.086	C.502	C.57E	41.047	-8.322	* 241.286	12.366	8.788
	632C.C	16.54	*	6.663	4.715	96.710	* -14.813	2.157	208.946	C.506	C.547	41.046	-13.000	* 227.913	13.776	9.881
	633C.C	18.01	*	6.674	4.768	96.974	* -15.856	2.119	218.806	C.51C	C.502	41.044	-17.695	* 216.798	15.579	11.339
			*				*							*		
62E1	629C.C	20.56	*	6.656	4.865	97.569	* -18.196	2.052	130.653	C.51E	2.6E3	41.040	24.350	* -24.241	18.558	13.863
5C	630C.C	18.7C	*	6.680	4.795	97.367	* -16.963	2.107	140.513	C.512	2.53C	41.043	19.601	* -32.863	16.392	12.015
	631C.C	17.09	*	6.668	4.741	97.196	* -16.022	2.152	150.373	C.50E	2.252	41.046	14.877	* -43.211	14.459	10.425
	632C.C	15.83	*	6.655	4.701	97.070	* -15.360	2.184	160.233	C.504	2.245	41.047	10.174	* -55.706	12.869	9.173
	633C.C	14.55	*	6.654	4.676	96.997	* -14.972	2.205	170.093	C.502	2.103	41.048	5.489	* -70.504	11.765	8.338
	634C.C	14.64	*	6.652	4.666	96.987	* -14.858	2.214	179.953	C.501	1.552	41.049	0.815	* -87.037	11.290	7.989
	635C.C	14.81	*	6.653	4.672	97.045	* -15.022	2.211	189.813	C.502	C.555	41.045	-3.855	* 256.142	11.521	8.158
	636C.C	15.45	*	6.657	4.652	97.172	* -15.473	2.196	199.673	C.502	C.577	41.048	-8.526	* 240.654	12.418	8.828
	637C.C	16.6C	*	6.665	4.727	97.368	* -16.225	2.170	209.533	C.506	C.545	41.047	-13.207	* 227.379	13.849	9.939
	638C.C	18.09	*	6.676	4.778	97.626	* -17.296	2.132	219.393	C.511	C.501	41.045	-17.905	* 216.351	15.668	11.412
			*				*							*		
62E1	634C.C	20.47	*	6.657	4.86E	98.179	* -19.531	2.072	131.240	C.51E	2.6E2	41.041	24.136	* -24.6C1	18.457	13.776
C	635C.C	18.62	*	6.681	4.800	97.988	* -18.287	2.126	141.100	C.512	2.525	41.044	19.390	* -33.286	16.301	11.939
	636C.C	17.02	*	6.665	4.746	97.828	* -17.339	2.169	150.960	C.50E	2.25C	41.047	14.665	* -43.716	14.381	10.363
	637C.C	15.75	*	6.661	4.706	97.709	* -16.675	2.20C	16C.820	C.504	2.246	41.048	5.969	* -56.308	12.810	9.127
	638C.C	14.57	*	6.655	4.682	97.643	* -16.290	2.220	170.68C	C.502	2.055	41.045	5.285	* -71.198	11.731	8.313
	639C.C	14.64	*	6.653	4.673	97.637	* -16.183	2.228	180.540	C.501	1.545	41.050	0.611	* -87.778	11.286	7.986
	640C.C	14.83	*	6.655	4.675	97.696	* -16.359	2.225	190.400	C.502	C.595	41.05C	-4.059	* 255.427	11.548	8.178
	641C.C	15.52	*	6.655	4.70C	97.822	* -16.827	2.210	200.260	C.504	C.576	41.045	-8.732	* 240.022	12.471	8.868
	642C.C	16.6E	*	6.667	4.736	98.014	* -17.601	2.184	210.120	C.507	C.542	41.047	-13.415	* 226.846	13.923	9.997
	643C.C	18.16	*	6.678	4.78E	98.266	* -18.698	2.147	219.980	C.511	C.555	41.045	-18.116	* 215.905	15.757	11.486
			*				*							*		
ECATE	TTIME	CV	SLM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1

ECATE	TTIME	DV	SLM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	DV1
				*				*								*			
				*				*								*			
6331	6390.C	20.39	*		6.658	4.873	98.780	*	-20.821	2.093	131.827	C.518	2.661	41.043	23.920	*	-24.964	18.356	13.689
315	6400.C	18.54	*		6.682	4.804	98.600	*	-19.569	2.145	141.687	C.512	2.527	41.045	19.178	*	-33.714	16.210	11.863
	6410.C	16.97	*		6.670	4.751	98.449	*	-18.617	2.187	151.547	C.508	2.387	41.047	14.460	*	-44.227	14.304	10.301
	6420.C	15.74	*		6.662	4.712	98.338	*	-17.952	2.217	161.407	C.504	2.243	41.045	9.762	*	-56.918	12.752	9.083
	6430.C	14.95	*		6.657	4.685	98.277	*	-17.571	2.236	171.267	C.502	2.095	41.050	5.080	*	-71.898	11.698	8.288
	6440.C	14.64	*		6.655	4.680	98.275	*	-17.472	2.244	181.127	C.501	1.945	41.051	0.406	*	-88.522	11.283	7.985
	6450.C	14.86	*		6.656	4.687	98.336	*	-17.661	2.240	190.987	C.502	C.594	41.050	-4.264	*	254.712	11.576	8.199
	6460.C	15.57	*		6.661	4.705	98.461	*	-18.146	2.225	200.847	C.504	C.575	41.049	-8.938	*	239.392	12.526	8.910
	6470.C	16.73	*		6.665	4.746	98.649	*	-18.940	2.199	210.707	C.507	C.542	41.048	-13.624	*	226.315	13.999	10.057
	6480.C	18.24	*		6.681	4.758	98.894	*	-20.062	2.162	220.567	C.511	C.556	41.046	-18.329	*	215.461	15.847	11.561
			*					*								*			
6381	6440.C	20.30	*		6.655	4.877	99.372	*	-22.067	2.114	132.414	C.518	2.655	41.044	23.704	*	-25.332	18.256	13.602
265	6450.C	18.47	*		6.683	4.810	99.202	*	-20.810	2.165	142.274	C.512	2.525	41.046	18.966	*	-34.147	16.119	11.787
	6460.C	16.91	*		6.672	4.757	99.059	*	-19.855	2.205	152.134	C.508	2.385	41.048	14.251	*	-44.745	14.227	10.240
	6470.C	15.70	*		6.663	4.715	98.956	*	-19.192	2.235	161.994	C.504	2.240	41.050	9.555	*	-57.535	12.694	9.039
	6480.C	14.52	*		6.658	4.656	98.901	*	-18.816	2.253	171.854	C.502	2.052	41.051	4.873	*	-72.606	11.666	8.265
	6490.C	14.64	*		6.657	4.688	98.903	*	-18.727	2.260	181.714	C.501	1.541	41.051	0.200	*	-89.271	11.282	7.984
	6500.C	14.88	*		6.658	4.655	98.965	*	-18.928	2.256	191.574	C.502	C.594	41.051	-4.471	*	253.996	11.606	8.221
	6510.C	15.62	*		6.663	4.718	99.089	*	-19.429	2.240	201.434	C.504	C.573	41.050	-9.146	*	238.762	12.583	8.953
	6520.C	16.75	*		6.671	4.756	99.273	*	-20.244	2.215	211.294	C.507	C.540	41.049	-13.834	*	225.785	14.075	10.118
	6530.C	18.32	*		6.683	4.805	99.512	*	-21.389	2.179	221.154	C.512	C.554	41.047	-18.543	*	215.018	15.939	11.637
			*					*								*			
6431	6450.C	20.21	*		6.700	4.883	99.953	*	-23.269	2.136	133.001	C.517	2.656	41.045	23.486	*	-25.703	18.155	13.515
219	6500.C	18.40	*		6.685	4.815	99.793	*	-22.010	2.186	142.861	C.512	2.522	41.047	18.753	*	-34.585	16.029	11.711
	6510.C	16.85	*		6.673	4.763	99.660	*	-21.055	2.225	152.721	C.507	2.362	41.049	14.040	*	-45.270	14.151	10.179
	6520.C	15.66	*		6.665	4.726	99.564	*	-20.395	2.253	162.581	C.504	2.237	41.051	9.347	*	-58.160	12.638	8.995
	6530.C	14.90	*		6.660	4.703	99.515	*	-20.025	2.270	172.441	C.502	2.088	41.052	4.666	*	-73.320	11.635	8.242
	6540.C	14.44	*		6.658	4.656	99.520	*	-19.946	2.277	182.301	C.502	1.000	41.052	-0.007	*	270.000	11.282	7.984
	6550.C	14.90	*		6.660	4.704	99.583	*	-20.160	2.272	192.161	C.502	C.593	41.052	-4.678	*	253.280	11.637	8.244
	6560.C	15.66	*		6.665	4.728	99.705	*	-20.677	2.257	202.021	C.504	C.572	41.051	-9.355	*	238.134	12.640	8.997
	6570.C	16.85	*		6.674	4.766	99.885	*	-21.511	2.231	211.881	C.507	C.538	41.050	-14.046	*	225.256	14.153	10.180
	6580.C	18.40	*		6.686	4.820	100.118	*	-22.679	2.196	221.741	C.512	C.552	41.048	-18.758	*	214.576	16.031	11.714
			*					*								*			
ECATE	TTIME	DV	SLM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	DV1

TABLE XIV. - TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATE	TIME	CV SUM *	CV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1
1653	1710.0	46.38 *	20.052	28.158	8.414 *	87.308	27.886	66.060	1.555	1.976	49.912	37.932 *	-17.370	32.148	26.330
183	1720.0	42.49 *	20.001	28.091	8.190 *	87.059	27.841	75.920	1.637	1.900	49.886	30.607 *	-27.400	28.609	22.992
	1730.0	40.03 *	19.955	28.031	8.014 *	86.862	27.799	85.780	1.703	1.816	49.863	23.455 *	-36.827	25.476	20.078
	1740.0	37.64 *	19.912	27.975	7.890 *	86.716	27.755	95.640	1.752	1.726	49.839	16.495 *	-51.855	22.910	17.730
	1750.0	35.95 *	19.868	27.917	7.814 *	86.620	27.706	105.500	1.782	1.629	49.811	9.745 *	-66.427	21.082	16.085
	1750.0	35.06 *	19.821	27.855	7.792 *	86.571	27.648	115.360	1.794	1.529	49.779	3.224 *	-82.005	20.126	15.236
	1770.0	34.96 *	19.767	27.785	7.814 *	86.565	27.577	125.220	1.790	0.998	49.739	-3.052 *	262.419	20.074	15.191
	1780.0	35.56 *	19.705	27.704	7.879 *	86.595	27.491	135.080	1.771	0.981	49.692	-9.067 *	247.915	20.829	15.860
	1790.0	36.72 *	19.632	27.609	7.981 *	86.658	27.388	144.940	1.740	0.948	49.635	-14.811 *	235.141	22.200	17.088
	1800.0	38.25 *	19.551	27.501	8.117 *	86.748	27.269	154.800	1.698	0.904	49.570	-20.275 *	224.241	23.977	18.701
1686	1750.0	43.55 *	19.566	27.520	8.471 *	87.106	27.255	72.503	1.578	1.937	49.562	33.435 *	-22.996	29.666	23.984
150	1760.0	40.42 *	19.521	27.462	8.274 *	86.887	27.216	82.363	1.647	1.856	49.540	26.259 *	-33.773	26.368	20.902
	1770.0	37.80 *	19.481	27.408	8.127 *	86.719	27.177	92.223	1.700	1.767	49.519	19.265 *	-46.097	23.561	18.322
	1780.0	35.82 *	19.441	27.355	8.032 *	86.603	27.135	102.083	1.736	1.673	49.496	12.473 *	-60.055	21.416	16.384
	1790.0	34.60 *	19.398	27.299	7.987 *	86.535	27.084	111.943	1.755	1.574	49.468	5.901 *	-75.335	20.050	15.205
	1800.0	34.18 *	19.350	27.236	7.989 *	86.511	27.021	121.803	1.757	1.000	49.434	-0.434 *	266.905	19.666	14.831
	1810.0	34.51 *	19.295	27.162	8.036 *	86.526	26.945	131.663	1.745	0.990	49.392	-6.517 *	253.805	20.101	15.214
	1820.0	35.45 *	19.231	27.077	8.124 *	86.576	26.854	141.523	1.720	0.964	49.342	-12.337 *	240.232	21.235	16.222
	1830.0	36.84 *	19.156	26.979	8.246 *	86.655	26.745	151.383	1.685	0.925	49.283	-17.885 *	228.541	22.860	17.684
	1840.0	38.51 *	19.072	26.866	8.400 *	86.758	26.620	161.243	1.641	0.875	49.216	-23.155 *	218.655	24.783	19.439
1736	1800.0	42.65 *	18.931	26.679	8.776 *	87.048	26.401	72.802	1.535	1.948	49.098	33.663 *	-22.178	29.350	23.724
100	1810.0	39.54 *	18.891	26.625	8.574 *	86.824	26.368	82.662	1.601	1.867	49.080	26.546 *	-32.800	26.094	20.649
	1820.0	36.91 *	18.854	26.576	8.422 *	86.653	26.334	92.522	1.651	1.779	49.062	19.609 *	-44.967	23.272	18.058
	1830.0	34.91 *	18.818	26.528	8.322 *	86.532	26.297	102.382	1.685	1.685	49.041	12.871 *	-58.801	21.089	16.092
	1840.0	33.65 *	18.780	26.476	8.272 *	86.460	26.251	112.242	1.704	1.586	49.017	6.350 *	-74.032	19.706	14.866
	1850.0	33.17 *	18.736	26.418	8.271 *	86.433	26.194	122.102	1.708	1.484	48.986	0.061 *	-89.844	19.216	14.437
	1860.0	33.45 *	18.686	26.350	8.314 *	86.445	26.124	131.962	1.697	0.991	48.949	-5.981 *	254.906	19.568	14.762
	1870.0	34.35 *	18.627	26.271	8.399 *	86.493	26.038	141.822	1.675	0.967	48.903	-11.766 *	241.155	20.670	15.719
	1880.0	35.70 *	18.558	26.179	8.519 *	86.570	25.936	151.682	1.643	0.929	48.849	-17.285 *	229.298	22.257	17.139
	1890.0	37.34 *	18.480	26.073	8.671 *	86.671	25.818	161.542	1.603	0.880	48.787	-22.534 *	219.280	24.153	18.863
1786	1850.0	41.83 *	18.238	25.882	9.083 *	86.989	25.593	73.101	1.496	1.960	48.668	33.882 *	-21.402	29.140	23.490
50	1860.0	38.72 *	18.302	25.833	8.875 *	86.761	25.564	82.961	1.558	1.879	48.653	26.821 *	-31.870	25.849	20.422
	1870.0	36.09 *	18.265	25.788	8.718 *	86.585	25.535	92.821	1.606	1.791	48.637	19.939 *	-43.882	23.012	17.823
	1880.0	34.07 *	18.236	25.744	8.613 *	86.460	25.502	102.681	1.639	1.697	48.620	13.254 *	-57.586	20.795	15.829
	1890.0	32.76 *	18.202	25.697	8.559 *	86.365	25.461	112.541	1.657	1.598	48.598	6.781 *	-72.757	19.358	14.561
	1900.0	32.24 *	18.162	25.643	8.554 *	86.354	25.409	122.401	1.662	1.496	48.571	0.536 *	-88.615	18.005	14.077
	1910.0	32.46 *	18.116	25.580	8.594 *	86.364	25.344	132.261	1.653	0.993	48.537	-5.467 *	256.000	19.114	14.347
	1920.0	33.31 *	18.062	25.506	8.676 *	86.409	25.264	142.121	1.634	0.969	48.496	-11.218 *	242.075	20.145	15.253
	1930.0	34.63 *	17.998	25.420	8.794 *	86.484	25.168	151.981	1.605	0.933	48.446	-16.709 *	230.051	21.693	16.632
	1940.0	36.25 *	17.925	25.320	8.945 *	86.583	25.057	161.841	1.568	0.885	48.388	-21.938 *	219.897	23.563	18.324
1836	1900.0	41.06 *	17.784	25.127	9.391 *	86.929	24.826	73.400	1.461	1.971	48.269	34.091 *	-20.664	28.915	23.278
C	1910.0	37.97 *	17.751	25.081	9.178 *	86.696	24.801	83.260	1.519	1.890	48.256	27.086 *	-30.984	25.629	20.219
	1920.0	35.33 *	17.721	25.040	9.016 *	86.516	24.777	93.120	1.564	1.802	48.243	20.257 *	-42.841	22.780	17.612
	1930.0	33.29 *	17.692	25.000	8.907 *	86.387	24.748	102.980	1.596	1.709	48.229	13.621 *	-56.411	20.530	15.594
	1940.0	31.95 *	17.660	24.957	8.848 *	86.308	24.711	112.840	1.615	1.610	48.210	7.195 *	-71.513	19.043	14.285
	1950.0	31.37 *	17.624	24.907	8.839 *	86.274	24.663	122.700	1.620	1.508	48.185	0.993 *	-87.407	18.427	13.750
	1960.0	31.55 *	17.582	24.849	8.876 *	86.281	24.603	132.560	1.613	0.994	48.155	-4.972 *	257.086	18.676	13.965
	1970.0	32.35 *	17.532	24.780	8.954 *	86.323	24.528	142.420	1.595	0.972	48.116	-10.691 *	242.989	19.655	14.821
	1980.0	33.63 *	17.472	24.699	9.071 *	86.396	24.438	152.280	1.569	0.936	48.070	-16.157 *	230.801	21.165	16.159
	1990.0	35.23 *	17.406	24.605	9.220 *	86.495	24.332	162.140	1.535	0.890	48.017	-21.367 *	220.505	23.010	17.820
ECATE	TIME	CV SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1

EDATE	TTIME	DV SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1
1886 317	1950.0	40.35 *	17.265	24.410	9.702 *	86.868	24.097	73.699	1.428	1.983	47.898	34.291 *	-19.964	28.710	23.087
	1960.0	37.27 *	17.235	24.368	9.483 *	86.630	24.076	83.559	1.483	1.902	47.888	27.339 *	-30.139	25.430	20.036
	1970.0	34.63 *	17.208	24.330	9.316 *	86.446	24.055	93.419	1.526	1.814	47.877	20.561 *	-41.843	22.571	17.423
	1980.0	32.56 *	17.181	24.293	9.202 *	86.313	24.030	103.279	1.557	1.720	47.864	13.974 *	-55.276	20.291	15.383
	1990.0	31.19 *	17.153	24.253	9.139 *	86.230	23.998	113.139	1.575	1.622	47.848	7.593 *	-70.301	18.756	14.035
	2000.0	30.57 *	17.120	24.208	9.126 *	86.193	23.954	122.999	1.581	1.520	47.826	1.432 *	-86.211	18.081	13.451
	2010.0	30.10 *	17.081	24.154	9.159 *	86.196	23.898	132.859	1.575	0.995	47.798	-4.498 *	258.161	18.270	13.614
	2020.0	31.46 *	17.035	24.089	9.235 *	86.237	23.828	142.719	1.559	0.974	47.763	-10.186 *	243.898	19.158	14.421
	2030.0	37.70 *	16.981	24.013	9.349 *	86.308	23.743	152.579	1.535	0.940	47.721	-15.627 *	231.545	20.670	15.719
	2040.0	34.27 *	16.916	23.924	9.497 *	86.405	23.643	162.439	1.505	0.894	47.671	-20.819 *	221.116	22.469	17.349
1936 267	2050.0	33.09 *	16.775	23.728	10.014 *	86.806	23.403	73.998	1.399	1.994	47.553	34.482 *	-19.300	28.525	22.913
	2060.0	30.62 *	16.751	23.689	9.790 *	86.563	23.386	83.858	1.450	1.913	47.544	27.582 *	-29.335	25.252	19.871
	2070.0	33.98 *	16.726	23.655	9.618 *	86.374	23.369	93.718	1.491	1.825	47.536	20.853 *	-40.888	22.383	17.254
	2080.0	31.90 *	16.703	23.621	9.498 *	86.238	23.347	103.578	1.521	1.732	47.525	14.313 *	-54.183	20.077	15.193
	2090.0	30.49 *	16.677	23.584	9.431 *	86.151	23.318	113.438	1.538	1.633	47.511	7.975 *	-65.122	18.456	13.809
	2090.0	29.62 *	16.647	23.542	9.414 *	86.110	23.279	123.298	1.544	1.531	47.492	1.853 *	-65.042	17.763	13.178
	2060.0	29.90 *	16.611	23.492	9.444 *	86.111	23.227	133.158	1.540	0.996	47.466	-4.042 *	259.223	17.894	13.290
	2070.0	30.62 *	16.565	23.432	9.518 *	86.149	23.161	143.018	1.526	0.976	47.434	-9.701 *	244.795	18.772	14.050
	2080.0	31.83 *	16.518	23.360	9.630 *	86.219	23.081	152.878	1.504	0.943	47.395	-15.119 *	232.283	20.267	15.308
	2090.0	33.37 *	16.455	23.276	9.777 *	86.315	22.986	162.738	1.476	0.899	47.349	-20.293 *	221.717	22.000	16.908
1986 217	2050.0	39.08 *	16.322	23.080	10.327 *	86.742	22.743	74.297	1.371	2.005	47.231	34.664 *	-18.671	28.356	22.754
	2060.0	36.02 *	16.297	23.043	10.098 *	86.495	22.729	84.157	1.420	1.924	47.225	27.814 *	-28.569	25.050	19.722
	2070.0	33.38 *	16.274	23.012	9.921 *	86.302	22.715	94.017	1.459	1.837	47.218	21.133 *	-39.975	22.215	17.101
	2080.0	31.27 *	16.253	22.981	9.797 *	86.161	22.696	103.877	1.487	1.743	47.209	14.638 *	-53.130	19.883	15.022
	2090.0	29.83 *	16.225	22.947	9.726 *	86.071	22.671	113.737	1.504	1.645	47.196	8.341 *	-67.978	18.259	13.605
	2100.0	29.13 *	16.202	22.908	9.705 *	86.027	22.635	123.597	1.511	1.543	47.179	2.257 *	-83.896	17.472	12.928
	2110.0	29.16 *	16.170	22.861	9.731 *	86.025	22.587	133.457	1.507	0.997	47.156	-3.605 *	260.270	17.545	12.991
	2120.0	29.83 *	16.130	22.805	9.802 *	86.060	22.525	143.317	1.495	0.978	47.127	-9.236 *	245.691	18.375	13.705
	2130.0	31.01 *	16.083	22.737	9.913 *	86.128	22.449	153.177	1.475	0.946	47.090	-14.631 *	233.014	19.772	14.924
	2140.0	32.52 *	16.028	22.658	10.058 *	86.223	22.358	163.037	1.449	0.903	47.047	-19.789 *	222.311	21.539	16.494
2036 167	2100.0	38.50 *	15.893	22.462	10.643 *	86.678	22.112	74.597	1.346	2.017	46.931	34.838 *	-18.074	28.201	22.610
	2110.0	35.46 *	15.870	22.428	10.409 *	86.425	22.102	84.457	1.392	1.936	46.926	28.036 *	-27.841	24.944	19.587
	2120.0	32.61 *	15.845	22.399	10.226 *	86.228	22.091	94.317	1.429	1.848	46.921	21.402 *	-39.102	22.063	16.965
	2130.0	30.70 *	15.828	22.368	10.099 *	86.083	22.073	104.177	1.456	1.754	46.912	14.951 *	-52.112	19.768	14.868
	2140.0	29.23 *	15.807	22.337	10.023 *	85.989	22.050	114.037	1.473	1.656	46.901	8.695 *	-66.862	18.44	13.419
	2150.0	28.48 *	15.784	22.303	9.997 *	85.942	22.020	123.897	1.480	1.554	46.887	2.644 *	-82.777	17.204	12.700
	2160.0	28.47 *	15.754	22.260	10.021 *	85.938	21.975	133.757	1.477	0.997	46.866	-3.186 *	261.302	17.222	12.716
	2170.0	29.10 *	15.717	22.206	10.089 *	85.971	21.917	143.617	1.466	0.980	46.839	-8.790 *	246.573	18.003	13.384
	2180.0	30.24 *	15.674	22.143	10.147 *	86.037	21.845	153.477	1.448	0.949	46.806	-14.164 *	233.738	19.363	14.565
	2190.0	31.72 *	15.621	22.066	10.343 *	86.130	21.757	163.337	1.424	0.907	46.764	-19.303 *	222.901	21.163	16.104
2086 117	2150.0	37.97 *	15.485	21.872	10.961 *	86.612	21.511	74.896	1.323	2.028	46.650	35.004 *	-17.505	28.060	22.478
	2160.0	34.93 *	15.468	21.841	10.721 *	86.355	21.503	84.756	1.366	1.947	46.647	28.249 *	-27.148	24.911	19.466
	2170.0	32.29 *	15.448	21.811	10.535 *	86.152	21.492	94.616	1.401	1.859	46.642	21.660 *	-38.263	21.926	16.841
	2180.0	30.16 *	15.430	21.786	10.401 *	86.004	21.480	104.476	1.427	1.765	46.636	15.249 *	-51.141	19.551	14.730
	2190.0	28.66 *	15.411	21.757	10.321 *	85.906	21.460	114.336	1.444	1.667	46.627	9.031 *	-65.790	17.849	13.251
	2200.0	27.88 *	15.388	21.724	10.292 *	85.856	21.430	124.196	1.451	1.565	46.613	3.018 *	-81.678	16.957	12.491
	2210.0	27.82 *	15.361	21.683	10.313 *	85.849	21.389	134.056	1.449	0.998	46.594	-2.781 *	262.322	16.921	12.460
	2220.0	28.41 *	15.327	21.633	10.378 *	85.880	21.334	143.916	1.439	0.982	46.569	-8.359 *	247.450	17.654	13.085
	2230.0	29.51 *	15.287	21.573	10.485 *	85.944	21.266	153.776	1.422	0.952	46.538	-13.713 *	234.457	18.977	14.228
	2240.0	30.98 *	15.235	21.502	10.628 *	86.037	21.184	163.636	1.400	0.910	46.501	-18.840 *	223.479	20.654	15.740
EDATE	TTIME	DV SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1

PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

DATE	TIME	CV	SCV	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
2136 67	2200.0	37.47	15.105	21.309	11.280	86.545	20.936	75.195	1.302	2.039	46.388	35.161	-16.974	27.930	22.357	
	2210.0	34.44	15.090	21.280	11.035	86.283	20.930	85.055	1.343	1.958	46.386	28.451	-26.490	24.651	19.355	
	2220.0	31.80	15.071	21.253	10.844	86.076	20.922	94.915	1.376	1.870	46.382	21.906	-37.468	21.802	16.730	
	2230.0	29.66	15.051	21.229	10.705	85.924	20.912	104.775	1.401	1.776	46.378	15.535	-50.208	19.409	14.605	
	2240.0	28.14	15.030	21.203	10.621	85.822	20.895	114.635	1.417	1.678	46.370	9.354	-64.753	17.671	13.099	
	2250.0	27.32	15.018	21.172	10.588	85.769	20.888	124.495	1.424	1.576	46.358	3.374	-80.614	16.731	12.300	
	2200.0	27.22	14.992	21.134	10.606	85.759	20.830	134.355	1.422	0.999	46.340	-2.396	-263.317	16.643	12.226	
	2210.0	27.17	14.961	21.087	10.669	85.768	20.779	144.215	1.414	0.984	46.317	-7.949	-248.307	17.330	12.807	
	2220.0	28.84	14.923	21.030	10.774	85.851	20.714	154.075	1.399	0.955	46.288	-13.283	-235.162	18.617	13.914	
2250.0	30.28	14.876	20.963	10.916	85.942	20.636	163.935	1.378	0.914	46.253	-18.395	-224.050	20.308	15.397		
2146 17	2250.0	31.00	14.751	20.771	11.602	86.477	20.385	75.494	1.282	2.049	46.142	35.311	-16.467	27.811	22.245	
	2260.0	33.94	14.733	20.744	11.351	86.210	20.392	85.354	1.321	1.968	46.141	28.645	-25.865	24.581	19.255	
	2270.0	31.35	14.717	20.719	11.155	85.999	20.377	95.214	1.352	1.880	46.138	22.141	-36.710	21.651	16.630	
	2280.0	29.19	14.702	20.697	11.011	85.842	20.369	105.074	1.376	1.787	46.135	15.809	-49.314	19.280	14.492	
	2290.0	27.65	14.686	20.673	10.923	85.737	20.355	114.934	1.391	1.688	46.129	9.664	-63.752	17.509	12.961	
	2300.0	26.79	14.667	20.644	10.886	85.681	20.330	124.794	1.398	1.586	46.118	3.716	-79.578	16.524	12.125	
	2310.0	26.85	14.644	20.608	10.901	85.668	20.295	134.654	1.398	0.999	46.102	-2.026	-264.292	16.385	12.009	
	2320.0	27.16	14.615	20.564	10.961	85.695	20.246	144.514	1.390	0.985	46.081	-7.556	-249.153	17.025	12.549	
	2330.0	28.21	14.580	20.511	11.065	85.756	20.185	154.374	1.376	0.957	46.054	-12.870	-235.857	18.277	13.620	
2340.0	29.61	14.538	20.447	11.206	85.847	20.110	164.234	1.358	0.917	46.021	-17.969	-224.612	19.944	15.075		
2236 33	2300.0	30.56	14.413	20.256	11.928	86.408	19.858	75.733	1.264	2.060	45.912	35.453	-15.987	27.702	22.143	
	2310.0	33.56	14.395	20.228	11.671	86.136	19.855	85.653	1.300	1.979	45.911	28.831	-25.267	24.481	19.163	
	2320.0	30.42	14.382	20.207	11.468	85.920	19.854	95.513	1.330	1.891	45.910	22.365	-35.988	21.590	16.540	
	2330.0	28.76	14.368	20.187	11.329	85.760	19.849	105.373	1.353	1.797	45.908	16.071	-48.458	19.164	14.391	
	2340.0	27.17	14.354	20.165	11.227	85.651	19.836	115.233	1.368	1.699	45.902	9.961	-62.786	17.362	12.835	
	2350.0	26.50	14.337	20.138	11.187	85.597	19.814	125.093	1.375	1.597	45.893	4.044	-78.570	16.332	11.965	
	2300.0	26.12	14.315	20.105	11.198	85.576	19.781	134.953	1.375	0.999	45.879	-1.671	-265.248	16.144	11.808	
	2310.0	26.60	14.285	20.064	11.250	85.601	19.736	144.813	1.368	0.986	45.859	-7.178	-245.984	16.741	12.308	
	2300.0	27.05	14.256	20.013	11.358	85.661	19.677	154.673	1.355	0.959	45.834	-12.474	-226.543	17.957	13.745	
2350.0	28.99	14.216	19.952	11.498	85.750	19.606	164.533	1.338	0.920	45.803	-17.560	-225.165	19.559	14.322		
2286 83	2300.0	30.14	14.093	19.701	12.253	86.337	19.350	70.392	1.247	2.071	45.694	35.589	-15.529	27.600	22.048	
	2300.0	33.16	14.076	19.737	11.991	86.060	19.352	85.952	1.281	1.990	45.695	29.006	-24.704	24.390	19.079	
	2310.0	30.52	14.055	19.717	11.783	85.841	19.353	95.812	1.310	1.902	45.696	22.580	-35.259	21.458	16.458	
	2300.0	28.55	14.034	19.699	11.630	85.676	19.349	105.672	1.331	1.808	45.694	16.322	-47.638	19.958	14.299	
	2310.0	28.16	14.014	19.678	11.533	85.504	19.339	115.532	1.346	1.709	45.690	10.245	-61.855	17.228	12.721	
	2400.0	25.04	14.024	19.654	11.449	85.501	19.319	125.392	1.353	1.607	45.681	4.358	-77.592	16.156	11.818	
	2410.0	25.63	14.004	19.622	11.477	85.483	19.289	135.252	1.353	1.000	45.668	-1.330	-266.182	15.921	11.622	
	2400.0	26.06	13.980	19.583	11.553	85.506	19.246	145.112	1.347	0.988	45.650	-6.816	-250.801	16.474	12.084	
	2410.0	27.04	13.949	19.535	11.653	85.564	19.190	154.972	1.336	0.962	45.627	-12.095	-237.217	17.656	13.086	
2440.0	28.40	13.912	19.478	11.742	85.653	19.121	164.832	1.319	0.923	45.598	-17.167	-225.709	19.274	14.487		
DATE	TIME	CV	SCV	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

ECATE	TTIME	DV SUM	DV1	VINF2	PHI2	ALPHA2	VCL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
2020 183	2100.0	30.80	15.740	22.575	10.638	86.804	22.320	70.880	1.435	2.041	47.029	37.323	-14.978	29.517	23.844
	2100.0	30.81	15.714	22.630	10.657	86.534	22.308	80.740	1.385	1.963	47.023	30.448	-24.317	26.149	20.700
	2100.0	30.91	15.597	22.606	10.137	86.319	22.296	90.630	1.426	1.877	47.018	23.735	-35.035	23.114	17.915
	2110.0	31.00	15.777	22.577	10.047	86.155	22.287	10.460	1.457	1.785	47.011	17.200	-47.439	20.553	15.614
	2100.0	30.80	15.750	22.547	9.946	86.044	22.261	110.320	1.478	1.689	47.001	10.857	-61.624	18.628	13.924
	2100.0	30.87	15.520	22.512	9.004	85.982	22.231	12.180	1.488	1.588	46.987	4.719	-77.232	17.450	12.944
	2100.0	30.81	15.430	22.470	9.912	85.903	22.190	130.040	1.489	1.000	46.968	-1.203	266.716	17.215	12.710
	2100.0	30.93	15.864	22.420	9.905	85.984	22.136	130.900	1.480	0.988	46.942	-6.900	251.476	17.752	13.168
	2100.0	30.81	15.822	22.359	10.000	86.033	22.068	140.760	1.464	0.961	46.910	-12.366	237.958	18.936	14.192
	2100.0	31.40	15.777	22.237	10.130	86.123	21.986	150.620	1.442	0.927	46.871	-17.599	226.445	20.569	15.628
2054 150	2100.0	30.47	15.760	22.245	10.605	86.582	21.898	70.323	1.351	2.000	46.830	33.076	-20.333	27.256	21.728
	2100.0	30.50	15.720	22.213	10.463	86.343	21.869	87.182	1.394	1.917	46.826	26.334	-30.420	24.088	18.803
	2100.0	30.61	15.731	22.183	10.294	86.150	21.875	97.043	1.427	1.827	46.819	19.764	-40.074	21.328	16.305
	2100.0	30.60	15.687	22.155	10.178	86.025	21.859	106.902	1.451	1.732	46.812	13.376	-55.525	19.132	14.363
	2100.0	30.67	15.561	22.124	10.115	85.943	21.835	116.763	1.465	1.633	46.801	7.187	-70.638	17.662	13.091
	2100.0	30.61	15.637	22.090	10.100	85.907	21.803	126.622	1.470	1.530	46.786	1.206	-86.686	17.034	12.556
	2100.0	30.55	15.607	22.044	10.135	85.912	21.756	136.483	1.465	0.995	46.764	-4.554	257.570	17.251	12.740
	2100.0	30.61	15.565	21.990	10.216	85.954	21.695	146.342	1.453	0.974	46.736	-10.089	241.251	18.150	13.545
	2200.0	30.55	15.523	21.927	10.333	86.027	21.617	156.203	1.433	0.940	46.700	-15.392	230.906	19.656	14.822
	2200.0	31.97	15.471	21.846	10.485	86.127	21.530	166.062	1.409	0.895	46.659	-20.468	220.518	21.462	16.425
2104 100	2100.0	30.90	15.345	21.665	11.007	86.515	21.306	77.622	1.328	2.011	46.557	33.252	-19.747	27.123	21.604
	2100.0	30.61	15.325	21.635	10.774	86.271	21.300	87.482	1.368	1.928	46.553	26.555	-29.703	23.960	18.686
	2100.0	31.40	15.310	21.608	10.600	86.081	21.289	97.342	1.400	1.838	46.549	20.028	-41.216	21.152	16.184
	2200.0	30.50	15.297	21.583	10.477	85.945	21.276	107.202	1.423	1.743	46.543	13.681	-54.535	18.972	14.223
	2210.0	30.19	15.274	21.554	10.412	85.859	21.255	117.062	1.437	1.644	46.533	7.529	-69.563	17.461	12.919
	2200.0	30.50	15.251	21.520	10.385	85.820	21.223	126.922	1.441	1.541	46.518	1.583	-85.608	16.780	12.341
	2200.0	30.77	15.227	21.478	10.427	85.822	21.179	136.782	1.438	0.996	46.498	-4.148	258.550	16.944	12.480
	2200.0	30.43	15.188	21.426	10.503	85.862	21.122	146.642	1.426	0.976	46.473	-9.659	244.080	17.838	13.242
	2200.0	30.63	15.140	21.365	10.620	85.934	21.052	156.502	1.409	0.943	46.441	-14.946	231.578	19.213	14.486
	2200.0	31.16	15.095	21.242	10.772	86.033	20.967	166.362	1.386	0.899	46.402	-20.008	221.062	21.057	16.063
2154 50	2200.0	30.47	14.977	21.112	11.321	86.446	20.741	77.921	1.306	2.022	46.300	33.419	-19.191	27.000	21.490
	2200.0	30.54	14.956	21.084	11.083	86.197	20.737	87.781	1.344	1.939	46.299	26.766	-29.022	23.844	18.580
	2200.0	31.07	14.942	21.059	10.909	86.003	20.729	97.641	1.375	1.849	46.295	20.280	-40.397	21.070	16.075
	2200.0	30.07	14.926	21.035	10.783	85.863	20.718	107.501	1.397	1.754	46.290	13.972	-53.583	18.827	14.097
	2200.0	30.67	14.905	21.009	10.711	85.774	20.699	117.361	1.410	1.655	46.282	7.856	-68.522	17.277	12.763
	2200.0	30.03	14.982	20.977	10.691	85.732	20.670	127.221	1.415	1.552	46.269	1.942	-84.562	16.547	12.145
	2200.0	30.10	14.862	20.938	10.720	85.732	20.630	137.081	1.412	0.996	46.251	-3.761	259.506	16.660	12.240
	2200.0	30.70	14.830	20.889	10.794	85.769	20.576	146.941	1.402	0.978	46.227	-9.249	244.893	17.510	12.961
	2300.0	30.96	14.791	20.831	10.909	85.840	20.509	156.801	1.386	0.946	46.197	-14.517	232.242	18.912	14.171
	2310.0	30.47	14.745	20.762	11.060	85.938	20.428	166.661	1.365	0.903	46.161	-19.567	221.599	20.673	15.721
2204 C	2200.0	30.01	14.627	20.582	11.642	86.376	20.199	70.220	1.286	2.032	46.060	33.577	-18.664	26.888	21.385
	2200.0	30.07	14.605	20.555	11.404	86.127	20.195	80.080	1.322	1.949	46.059	26.969	-28.369	23.739	18.484
	2200.0	30.57	14.594	20.533	11.219	85.925	20.192	90.940	1.351	1.860	46.057	20.522	-39.614	20.959	15.976
	2300.0	30.06	14.580	20.512	11.089	85.781	20.183	100.800	1.372	1.765	46.053	14.252	-52.669	18.696	13.983
	2310.0	30.18	14.564	20.487	11.013	85.688	20.167	110.660	1.386	1.665	46.046	8.170	-67.514	17.110	12.620
	2300.0	30.51	14.545	20.458	10.989	85.642	20.141	120.520	1.391	1.563	46.035	2.287	-83.542	16.332	11.965
	2300.0	30.54	14.521	20.421	11.015	85.540	20.103	130.380	1.388	0.997	46.018	-3.390	260.446	16.355	12.018
	2300.0	30.19	14.491	20.375	11.087	85.676	20.052	140.240	1.379	0.980	45.996	-8.855	245.694	17.202	12.699
	2300.0	30.33	14.455	20.320	11.200	85.744	19.988	150.100	1.364	0.948	45.968	-14.107	232.896	18.572	13.875
	2300.0	30.81	14.412	20.255	11.350	85.842	19.911	160.960	1.345	0.906	45.935	-19.144	222.127	20.311	15.400
ECATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VCL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1



TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATE	TIME	OV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
2254	2320.0	35.59	14.296	20.075	11.965	86.305	19.680	78.519	1.268	2.043	45.835	33.728	-18.165	26.785	21.289
317	2330.0	32.68	14.275	20.050	11.722	86.047	19.679	80.379	1.302	1.960	45.834	27.161	-27.754	23.643	18.396
	2340.0	30.15	14.267	20.030	11.531	85.844	19.677	93.239	1.330	1.870	45.834	20.753	-38.868	20.859	15.887
	2350.0	28.13	14.254	20.010	11.397	85.697	19.671	108.099	1.350	1.775	45.831	14.520	-51.752	18.577	13.880
	2360.0	26.73	14.235	19.987	11.316	85.600	19.657	117.959	1.362	1.676	45.825	8.471	-66.541	16.957	12.491
	2370.0	26.02	14.221	19.960	11.269	85.552	19.633	127.819	1.368	1.573	45.815	2.617	-82.549	16.133	11.799
	2380.0	26.01	14.199	19.925	11.312	85.547	19.597	137.679	1.366	0.998	45.800	-3.034	-261.367	16.148	11.811
	2390.0	26.63	14.171	19.882	11.351	85.581	19.550	147.539	1.358	0.981	45.779	-8.478	-246.482	16.914	12.454
	2400.0	27.74	14.137	19.830	11.493	85.648	19.489	157.399	1.344	0.951	45.753	-13.712	-233.541	18.251	13.598
	2410.0	29.19	14.098	19.768	11.643	85.745	19.415	167.259	1.326	0.909	45.722	-18.738	-222.647	19.669	15.097
2304	2370.0	35.18	13.981	19.508	12.291	86.233	19.180	78.818	1.251	2.054	45.623	33.873	-17.685	26.650	21.201
267	2380.0	32.27	13.969	19.566	12.041	85.970	19.183	88.678	1.283	1.971	45.624	27.344	-27.169	23.556	18.317
	2390.0	29.76	13.957	19.647	11.846	85.763	19.184	98.536	1.309	1.881	45.624	20.974	-38.156	20.769	15.806
	2400.0	27.73	13.945	19.729	11.706	85.611	19.179	108.398	1.329	1.786	45.622	14.776	-50.951	18.469	13.786
	2410.0	26.30	13.932	19.808	11.622	85.512	19.167	118.258	1.341	1.686	45.617	8.759	-65.601	16.817	12.373
	2420.0	25.56	13.917	19.883	11.591	85.460	19.145	128.118	1.346	1.583	45.608	2.934	-81.582	15.950	11.646
	2430.0	25.51	13.899	19.950	11.611	85.453	19.112	137.978	1.345	0.998	45.594	-2.692	-262.268	15.918	11.620
	2440.0	26.07	13.865	19.910	11.679	85.465	19.067	147.838	1.338	0.983	45.575	-8.116	-247.257	16.643	12.226
	2450.0	27.17	13.837	19.860	11.759	85.551	19.009	157.698	1.325	0.953	45.551	-13.334	-234.175	17.949	13.337
	2460.0	28.61	13.807	19.801	11.939	85.647	18.935	167.558	1.309	0.912	45.521	-18.349	-223.157	19.444	14.812
2354	2470.0	34.61	13.688	19.123	12.618	86.159	18.703	79.117	1.235	2.064	45.424	34.008	-17.241	26.601	21.119
217	2480.0	31.92	13.675	19.102	12.362	85.891	18.707	88.977	1.265	1.981	45.426	27.518	-26.614	23.476	18.244
	2490.0	29.40	13.663	19.085	12.142	85.680	18.710	98.837	1.290	1.891	45.427	21.185	-37.477	20.686	15.733
	2500.0	27.35	13.651	19.068	12.018	85.525	18.707	108.697	1.307	1.796	45.426	15.021	-50.146	18.371	13.702
	2510.0	25.91	13.641	19.048	11.931	85.422	18.697	118.557	1.321	1.696	45.422	9.036	-64.696	16.689	12.265
	2520.0	25.13	13.626	19.025	11.895	85.367	18.677	128.417	1.326	1.593	45.413	3.238	-80.645	15.781	11.506
	2530.0	25.03	13.607	18.994	11.913	85.358	18.646	138.277	1.325	0.999	45.401	-2.365	-263.149	15.704	11.442
	2540.0	25.57	13.588	18.956	11.974	85.388	18.603	148.137	1.319	0.984	45.383	-7.769	-248.017	16.388	12.012
	2550.0	26.65	13.559	18.909	12.087	85.452	18.548	157.997	1.307	0.956	45.360	-12.972	-234.798	17.663	13.092
	2560.0	28.06	13.529	18.852	12.236	85.548	18.480	167.857	1.292	0.915	45.333	-17.975	-223.658	19.337	14.543
2404	2470.0	34.45	13.497	18.672	12.967	86.009	18.244	79.417	1.220	2.075	45.237	34.136	-16.818	26.520	21.043
167	2480.0	31.57	13.337	18.657	12.806	85.812	18.250	89.277	1.249	1.991	45.240	27.684	-26.086	23.402	18.177
	2490.0	29.05	13.097	18.641	12.611	85.597	18.254	99.137	1.273	1.901	45.241	21.387	-36.831	20.612	15.667
	2500.0	27.03	13.171	18.623	12.332	85.437	18.253	108.997	1.290	1.806	45.241	15.255	-49.376	18.283	13.625
	2510.0	25.53	13.167	18.607	12.241	85.331	18.245	118.857	1.302	1.706	45.237	9.100	-63.824	16.572	12.166
	2520.0	24.73	13.151	18.585	12.232	85.273	18.227	128.717	1.307	1.603	45.230	3.529	-75.735	15.624	11.376
	2530.0	24.61	13.134	18.556	12.216	85.261	18.198	138.577	1.307	0.999	45.219	-2.951	-264.010	15.504	11.277
	2540.0	25.12	13.111	18.520	12.274	85.289	18.157	148.437	1.301	0.985	45.202	-7.435	-248.763	16.149	11.812
	2550.0	26.15	13.084	18.475	12.357	85.353	18.104	158.297	1.290	0.958	45.181	-12.624	-235.405	17.393	12.862
	2560.0	27.59	13.051	18.421	12.536	85.447	18.039	168.157	1.276	0.918	45.155	-17.617	-224.150	19.047	14.289
2454	2570.0	34.12	13.144	18.247	13.273	86.009	17.803	79.716	1.206	2.085	45.061	34.258	-16.417	26.444	20.973
117	2580.0	31.23	13.132	18.229	13.112	85.751	17.811	89.576	1.234	2.001	45.064	27.842	-25.585	23.335	18.116
	2590.0	28.73	13.124	18.214	12.957	85.512	17.816	99.436	1.256	1.911	45.066	21.579	-36.214	20.544	15.606
	2600.0	26.67	13.111	18.190	12.847	85.367	17.816	109.296	1.273	1.816	45.066	15.480	-48.638	18.202	13.555
	2610.0	25.16	13.100	18.163	12.852	85.239	17.810	119.156	1.284	1.716	45.064	9.553	-62.985	16.465	12.076
	2620.0	24.35	13.090	18.167	12.811	85.170	17.793	129.016	1.290	1.613	45.057	3.808	-78.853	15.480	11.257
	2630.0	24.22	13.078	18.135	12.822	85.163	17.767	138.876	1.289	0.999	45.047	-1.750	-264.849	15.317	11.124
	2640.0	24.68	13.055	18.101	12.883	85.191	17.728	148.736	1.284	0.986	45.032	-7.116	-249.493	15.924	11.624
	2650.0	25.67	13.027	18.059	12.947	85.272	17.677	158.596	1.274	0.960	45.012	-12.291	-236.009	17.138	12.645
	2660.0	27.05	12.999	18.016	13.039	85.346	17.614	168.456	1.261	0.921	44.987	-17.274	-224.631	18.771	14.049
ECATE	TIME	OV SUM	V.	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

ECATE	TIME	CV SUM *	CV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMD	VEL1	ALPHA1 *	PHI1	VINF1	DV1
2504 67	2500.0	33.22 *	12.894	17.836	13.611	85.932	17.379	87.015	1.194	2.095	44.895	34.372	-16.037	26.373	20.907
	2500.0	30.54 *	12.884	17.818	13.340	85.649	17.387	87.875	1.219	2.011	44.898	27.992	-25.109	23.273	18.059
	2500.0	28.43 *	12.875	17.804	13.124 *	85.425	17.394	90.725	1.241	1.921	44.901	21.763	-35.628	20.461	15.551
	2600.0	26.35 *	12.867	17.790	12.867	85.258	17.396	100.595	1.257	1.826	44.902	15.694	-47.933	18.128	13.492
	2600.0	24.85 *	12.857	17.775	12.866	85.144	17.391	114.455	1.268	1.726	44.900	9.795	-62.178	16.367	11.994
	2600.0	23.90 *	12.846	17.755	12.822	85.081	17.376	124.315	1.273	1.622	44.894	4.075	-78.000	15.346	11.147
	2600.0	23.81 *	12.830	17.730	12.831	85.065	17.351	137.175	1.273	0.999	44.884	-1.461	-265.666	15.143	10.981
	2600.0	24.26 *	12.811	17.697	12.889	85.039	17.315	147.035	1.268	0.987	44.870	-6.810	-250.206	15.712	11.449
	2600.0	25.23 *	12.787	17.657	12.975	85.150	17.266	158.895	1.257	0.961	44.852	-11.971	-236.596	16.898	12.441
2600.0	26.58 *	12.757	17.607	13.142 *	85.244	17.206	168.755	1.247	0.923	44.828	-16.945	-225.103	18.510	13.822	
2554 17	2600.0	35.55 *	12.657	17.439	13.946 *	85.854	16.970	80.314	1.182	2.105	44.738	34.480	-15.678	26.306	20.845
	2600.0	33.65 *	12.647	17.422	13.671	85.566	16.980	90.174	1.206	2.021	44.742	28.135	-24.658	23.215	18.007
	2600.0	28.14 *	12.635	17.409	13.450	85.338	16.988	100.034	1.226	1.931	44.745	21.937	-35.069	20.424	15.500
	2600.0	25.07 *	12.631	17.396	13.287	85.166	16.991	110.894	1.242	1.835	44.746	15.899	-47.260	18.061	13.434
	2600.0	24.54 *	12.623	17.382	13.183	85.050	16.987	119.754	1.252	1.735	44.745	10.027	-61.403	16.277	11.919
	2600.0	23.66 *	12.617	17.364	13.135	84.984	16.974	129.614	1.257	1.632	44.740	4.331	-77.175	15.222	11.045
	2600.0	23.45 *	12.599	17.340	13.141	84.964	16.951	139.474	1.258	1.000	44.731	-1.184	-266.461	14.980	10.848
	2600.0	23.86 *	12.580	17.309	13.176	84.987	16.916	149.344	1.253	0.988	44.718	-6.516	-250.904	15.513	11.284
	2700.0	24.81 *	12.557	17.270	13.302	85.047	16.870	159.194	1.245	0.963	44.701	-11.664	-237.171	16.670	12.248
2700.0	26.14 *	12.525	17.223	13.449 *	85.140	16.811	169.054	1.234	0.926	44.679	-16.629	-225.564	18.262	13.607	
2604 33	2600.0	35.22 *	12.432	17.658	14.284 *	85.774	16.575	80.613	1.171	2.115	44.590	34.582	-15.338	26.244	20.787
	2600.0	31.38 *	12.422	17.642	14.002	85.482	16.587	90.473	1.194	2.031	44.595	28.270	-24.230	23.162	17.958
	2600.0	27.80 *	12.410	17.629	13.777	85.249	16.596	100.333	1.213	1.941	44.598	22.104	-34.538	20.372	15.454
	2700.0	25.79 *	12.402	17.617	13.610	85.073	16.601	110.193	1.227	1.845	44.600	16.094	-46.616	18.000	13.381
	2700.0	24.25 *	12.400	17.604	13.502	84.953	16.598	120.053	1.237	1.745	44.599	10.249	-60.659	16.194	11.850
	2700.0	23.34 *	12.390	16.786	13.450	84.835	16.587	129.913	1.242	1.641	44.594	4.576	-76.378	15.107	10.951
	2700.0	23.10 *	12.377	16.964	13.454	84.663	16.565	139.773	1.243	1.000	44.586	-0.920	-267.234	14.828	10.724
	2700.0	23.43 *	12.360	16.935	13.509	84.884	16.532	149.633	1.239	0.989	44.574	-6.235	-251.585	15.325	11.130
	2700.0	24.41 *	12.338	16.898	13.612	84.943	16.487	159.493	1.232	0.965	44.558	-11.370	-237.733	16.454	12.067
2700.0	25.72 *	12.312	16.853	13.759 *	85.035	16.431	169.353	1.221	0.928	44.537	-16.326	-226.015	18.027	13.405	
2654 83	2700.0	32.95 *	12.218	16.690	14.624 *	85.693	16.195	80.912	1.160	2.125	44.450	34.678	-15.016	26.165	20.733
	2700.0	30.12 *	12.205	16.675	14.337	85.396	16.208	90.772	1.182	2.041	44.455	28.398	-23.823	23.112	17.913
	2700.0	27.61 *	12.202	16.663	14.106 *	85.158	16.218	100.632	1.200	1.950	44.459	22.262	-34.032	20.324	15.412
	2700.0	25.53 *	12.194	16.652	13.935	84.979	16.224	110.492	1.214	1.854	44.461	16.281	-46.002	17.943	13.333
	2700.0	23.97 *	12.185	16.639	13.823	84.856	16.223	120.352	1.224	1.754	44.460	10.461	-55.945	16.118	11.786
	2700.0	23.04 *	12.175	16.623	13.768	84.784	16.213	130.212	1.229	1.650	44.457	4.811	-75.609	15.001	10.864
	2700.0	22.78 *	12.167	16.602	13.769 *	84.760	16.192	140.072	1.229	1.000	44.449	-0.666	-267.985	14.685	10.608
	2700.0	23.14 *	12.151	16.574	13.822	84.780	16.161	149.932	1.226	0.990	44.438	-5.965	-252.249	15.148	10.985
	2800.0	24.03 *	12.131	16.539	13.924 *	84.838	16.118	159.792	1.219	0.966	44.422	-11.088	-238.282	16.250	11.896
2800.0	25.32 *	12.106	16.496	14.070 *	84.929	16.064	169.652	1.209	0.930	44.403	-16.036	-226.455	17.804	13.213	
ECATE	TIME	CV SUM *	CV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMD	VEL1	ALPHA1 *	PHI1	VINF1	DV1

TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

EDATE	TTIME	CV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
2387	2460.0	32.71	13.490	18.807	12.669	85.931	18.396	85.560	1.244	2.019	45.298	29.986	-22.688	24.539	19.215
183	2470.0	32.04	13.475	18.790	12.445	85.696	18.400	95.420	1.270	1.932	45.300	23.619	-32.886	21.613	16.560
	2480.0	27.80	13.465	18.774	12.277	85.518	18.401	105.280	1.290	1.838	45.300	17.414	-44.781	19.100	14.335
	2490.0	26.11	13.458	18.756	12.165	85.393	18.395	115.140	1.304	1.740	45.298	11.383	-58.583	17.151	12.656
	2500.0	25.07	13.445	18.735	12.109	85.319	18.380	125.000	1.312	1.638	45.292	5.535	-74.076	15.922	11.623
	2510.0	24.71	13.429	18.709	12.106	85.292	18.355	134.860	1.314	1.000	45.282	-0.124	-269.640	15.512	11.283
	2520.0	25.02	13.408	18.675	12.152	85.307	18.318	144.720	1.309	0.992	45.267	-5.587	-253.913	15.904	11.608
	2530.0	25.88	13.381	18.632	12.244	85.358	18.269	154.580	1.300	0.969	45.247	-10.853	-235.850	16.962	12.496
	2540.0	27.16	13.345	18.581	12.378	85.442	18.207	164.440	1.287	0.933	45.222	-15.921	-227.875	18.495	13.808
	2550.0	28.72	13.312	18.521	12.550	85.554	18.133	174.300	1.270	0.887	45.192	-20.795	-217.872	20.326	15.413
2421	2560.0	30.75	13.301	18.502	12.738	85.721	18.097	92.303	1.250	1.971	45.178	26.053	-28.598	22.599	17.449
150	2510.0	28.34	13.291	18.487	12.546	85.519	18.101	101.862	1.272	1.880	45.179	19.810	-39.752	19.916	15.051
	2520.0	26.43	13.282	18.471	12.411	85.373	18.098	111.723	1.288	1.783	45.179	13.736	-52.768	17.730	13.149
	2530.0	25.12	13.277	18.453	12.332	85.279	18.088	121.582	1.298	1.682	45.174	7.839	-67.647	16.200	11.854
	2540.0	24.49	13.256	18.429	12.308	85.233	18.068	131.443	1.301	1.579	45.166	2.127	-83.774	15.456	11.238
	2550.0	24.54	13.237	18.399	12.334	85.231	18.037	141.302	1.300	0.997	45.154	-3.394	-266.092	15.536	11.304
	2560.0	25.13	13.214	18.362	12.409	85.268	17.994	151.163	1.293	0.980	45.137	-8.721	-245.250	16.346	11.977
	2570.0	26.32	13.186	18.315	12.527	85.340	17.938	161.022	1.281	0.949	45.115	-13.853	-232.412	17.708	13.131
	2580.0	27.78	13.152	18.260	12.686	85.442	17.871	170.983	1.266	0.907	45.088	-18.792	-221.643	19.435	14.628
	2590.0	29.46	13.112	18.195	12.879	85.570	17.791	180.742	1.249	0.856	45.056	-23.542	-212.661	21.376	16.348
2471	2500.0	30.43	13.042	18.081	13.063	85.639	17.664	92.302	1.235	1.982	45.006	26.218	-28.077	22.535	17.390
100	2560.0	28.02	13.034	18.066	12.867	85.433	17.669	102.162	1.256	1.890	45.008	20.008	-39.114	19.448	14.991
	2570.0	26.10	13.025	18.052	12.727	85.282	17.668	112.022	1.271	1.793	45.008	13.964	-52.012	17.646	13.078
	2580.0	24.77	13.014	18.034	12.644	85.185	17.659	121.882	1.280	1.692	45.004	8.095	-66.800	16.087	11.760
	2590.0	24.11	13.001	18.013	12.616	85.136	17.641	131.742	1.284	1.588	44.997	2.408	-82.905	15.305	11.113
	2600.0	24.13	12.984	17.984	12.645	85.132	17.612	141.602	1.283	0.997	44.986	-3.092	-260.900	15.343	11.145
	2610.0	24.75	12.967	17.949	12.713	85.168	17.571	151.462	1.276	0.981	44.970	-8.402	-245.940	16.117	11.785
	2620.0	25.65	12.936	17.904	12.831	85.239	17.518	161.322	1.266	0.951	44.949	-13.521	-232.975	17.452	12.912
	2630.0	27.27	12.904	17.851	12.989	85.340	17.452	171.182	1.252	0.910	44.924	-18.451	-222.094	19.161	14.388
	2640.0	28.96	12.866	17.790	13.183	85.468	17.375	181.042	1.236	0.859	44.894	-23.197	-213.024	21.051	16.093
2521	2600.0	30.13	12.798	17.675	13.391	85.555	17.247	92.601	1.221	1.992	44.844	26.374	-27.582	22.475	17.336
50	2610.0	27.73	12.790	17.662	13.189	85.345	17.253	102.461	1.240	1.900	44.846	20.197	-38.507	19.786	14.936
	2620.0	25.79	12.781	17.648	13.045	85.191	17.253	112.321	1.255	1.803	44.847	14.183	-51.288	17.570	13.012
	2630.0	24.45	12.772	17.632	12.958	85.090	17.246	122.181	1.264	1.702	44.844	8.340	-65.985	15.983	11.674
	2640.0	23.76	12.760	17.612	12.927	85.039	17.230	132.041	1.268	1.598	44.838	2.677	-82.062	15.164	10.998
	2650.0	23.74	12.744	17.585	12.949	85.032	17.202	141.901	1.267	0.998	44.827	-2.803	-261.688	15.163	10.997
	2660.0	24.33	12.723	17.551	13.023	85.067	17.163	151.761	1.261	0.982	44.812	-8.096	-246.616	15.901	11.606
	2670.0	25.40	12.698	17.509	13.136	85.136	17.112	161.621	1.251	0.953	44.793	-13.203	-233.525	17.210	12.705
	2680.0	26.83	12.668	17.458	13.244	85.238	17.049	171.481	1.239	0.912	44.769	-18.125	-222.535	18.900	14.161
	2690.0	28.48	12.633	17.399	13.489	85.366	16.975	181.341	1.223	0.863	44.740	-22.867	-213.378	20.819	15.851
2571	2600.0	29.85	12.566	17.285	13.720	85.470	16.844	92.900	1.207	2.001	44.691	26.523	-27.112	22.420	17.287
0	2660.0	27.44	12.558	17.272	13.514	85.255	16.852	102.760	1.226	1.909	44.694	20.377	-37.927	19.729	14.886
	2670.0	25.50	12.551	17.260	13.365	85.098	16.854	112.620	1.240	1.812	44.695	14.392	-50.595	17.500	12.953
	2680.0	24.14	12.542	17.245	13.275	84.994	16.848	122.480	1.249	1.711	44.692	8.575	-65.200	15.888	11.594
	2690.0	23.42	12.530	17.226	13.240	84.940	16.833	132.340	1.253	1.607	44.687	2.935	-81.246	15.033	10.891
	2700.0	23.37	12.516	17.200	13.259	84.931	16.808	142.200	1.252	0.998	44.677	-2.526	-262.455	14.933	10.859
	2710.0	23.93	12.497	17.168	13.329	84.964	16.770	152.060	1.247	0.983	44.663	-7.803	-247.276	15.658	11.437
	2720.0	24.93	12.473	17.128	13.444	85.033	16.721	161.920	1.238	0.955	44.645	-12.898	-234.064	16.980	12.511
	2730.0	26.39	12.445	17.080	13.602	85.134	16.661	171.780	1.226	0.915	44.622	-17.812	-222.966	18.653	13.946
	2740.0	28.03	12.411	17.023	13.797	85.262	16.588	181.640	1.211	0.866	44.595	-22.550	-213.724	20.562	15.622
EDATE	TTIME	CV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

ECATE	TTIME	CV	SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
2621	2700.0	29.59	*	12.345	16.909	14.057	85.384	16.457	93.199	1.195	2.011	44.546	26.664	-26.665	22.369	17.241
317	2710.0	27.18	*	12.338	16.897	13.840	85.165	16.465	104.059	1.212	1.919	44.549	20.549	-37.376	19.677	14.841
	2720.0	29.23	*	12.331	16.886	13.684	85.003	16.469	112.919	1.226	1.822	44.551	14.591	-49.933	17.436	12.898
	2730.0	23.84	*	12.323	16.872	13.533	84.836	16.464	122.779	1.234	1.720	44.549	8.800	-64.446	15.800	11.522
	2740.0	23.13	*	12.312	16.854	13.556	84.840	16.451	132.639	1.238	1.616	44.544	3.182	-80.457	14.912	10.792
	2750.0	23.03	*	12.295	16.830	13.572	84.829	16.427	142.499	1.238	0.999	44.535	-2.260	263.201	14.835	10.729
	2760.0	23.56	*	12.281	16.799	13.640	84.860	16.391	152.359	1.233	0.984	44.522	-7.522	247.921	15.506	11.279
	2770.0	24.59	*	12.254	16.761	13.754	84.928	16.344	162.219	1.225	0.957	44.505	-12.605	234.591	16.763	12.327
	2780.0	25.97	*	12.232	16.715	13.912	85.028	16.285	172.079	1.213	0.917	44.483	-17.512	223.387	18.418	13.742
	2790.0	27.61	*	12.201	16.662	14.108	85.157	16.215	181.939	1.200	0.868	44.458	-22.246	214.061	20.316	15.405
2671	2700.0	29.33	*	12.136	16.547	14.386	85.296	16.083	93.498	1.183	2.021	44.409	26.798	-26.242	22.322	17.198
267	2710.0	26.93	*	12.124	16.536	14.170	85.073	16.093	103.356	1.200	1.929	44.413	20.712	-36.851	19.630	14.799
	2720.0	24.97	*	12.123	16.525	14.012	84.908	16.097	113.218	1.212	1.831	44.415	14.782	-49.300	17.318	12.848
	2730.0	23.57	*	12.114	16.512	13.914	84.797	16.074	123.078	1.221	1.730	44.413	9.015	-63.722	15.719	11.455
	2740.0	22.61	*	12.106	16.495	13.873	84.738	16.082	132.938	1.225	1.625	44.409	3.418	-79.694	14.799	10.700
	2750.0	22.73	*	12.093	16.473	13.888	84.725	16.059	142.798	1.224	0.999	44.401	-2.005	263.927	14.686	10.609
	2760.0	23.21	*	12.076	16.443	13.953	84.755	16.025	152.658	1.220	0.985	44.389	-7.253	248.550	15.325	11.130
	2770.0	24.21	*	12.055	16.407	14.067	84.822	15.980	162.518	1.212	0.958	44.372	-12.325	235.105	16.556	12.153
	2780.0	25.58	*	12.030	16.362	14.225	84.922	15.923	172.378	1.202	0.920	44.352	-17.224	223.758	18.155	13.549
	2790.0	27.27	*	12.000	16.310	14.422	85.051	15.855	182.238	1.189	0.871	44.328	-21.954	214.389	20.083	15.198
2721	2800.0	29.19	*	11.937	16.198	14.722	85.208	15.722	93.797	1.172	2.030	44.280	26.925	-25.840	22.278	17.159
217	2810.0	26.69	*	11.931	16.188	14.501	84.980	15.732	103.657	1.188	1.938	44.284	20.868	-36.351	19.586	14.760
	2820.0	24.73	*	11.925	16.177	14.339	84.811	15.738	113.517	1.200	1.840	44.286	14.964	-48.695	17.324	12.803
	2830.0	23.31	*	11.918	16.165	14.238	84.697	15.736	123.377	1.208	1.739	44.285	9.220	-63.027	15.645	11.393
	2840.0	22.52	*	11.905	16.149	14.134	84.635	15.725	133.237	1.212	1.634	44.281	3.644	-78.957	14.654	10.615
	2850.0	22.39	*	11.897	16.128	14.205	84.621	15.704	143.097	1.212	0.999	44.274	-1.762	264.631	14.546	10.496
	2860.0	22.67	*	11.891	16.100	14.269	84.649	15.672	152.957	1.208	0.986	44.262	-6.995	246.163	15.154	10.989
	2870.0	23.85	*	11.862	16.065	14.382	84.715	15.628	162.817	1.201	0.963	44.247	-12.056	235.607	16.361	11.989
	2880.0	25.20	*	11.830	16.023	14.540	84.815	15.573	172.677	1.191	0.922	44.228	-16.948	224.198	17.983	13.367
	2890.0	26.81	*	11.810	15.972	14.738	84.944	15.507	182.537	1.174	0.874	44.204	-21.675	214.709	19.861	15.002
2771	2800.0	28.87	*	11.748	15.862	15.061	85.117	15.373	94.097	1.162	2.040	44.157	27.045	-25.458	22.237	17.121
167	2810.0	26.47	*	11.742	15.852	14.835	84.885	15.385	103.957	1.177	1.947	44.161	21.016	-35.875	19.545	14.725
	2820.0	24.50	*	11.737	15.842	14.669	84.713	15.391	113.817	1.188	1.849	44.164	15.137	-48.118	17.775	12.761
	2830.0	23.07	*	11.730	15.830	14.563	84.596	15.390	123.677	1.196	1.747	44.163	9.417	-62.360	15.576	11.336
	2840.0	22.26	*	11.722	15.815	14.516	84.531	15.381	133.537	1.200	1.642	44.160	3.861	-78.246	14.556	10.536
	2850.0	22.10	*	11.711	15.795	14.525	84.514	15.361	143.397	1.200	0.999	44.153	-1.528	265.315	14.415	10.391
	2860.0	22.55	*	11.696	15.769	14.588	84.541	15.330	153.257	1.196	0.987	44.142	-6.748	245.760	14.992	10.858
	2870.0	23.51	*	11.677	15.735	14.700	84.606	15.288	163.117	1.190	0.962	44.128	-11.799	236.096	16.176	11.834
	2880.0	24.85	*	11.655	15.695	14.857	84.706	15.235	172.977	1.180	0.924	44.109	-16.683	224.589	17.781	13.193
	2890.0	26.44	*	11.628	15.646	15.056	84.836	15.171	182.837	1.169	0.876	44.087	-21.407	215.020	19.649	14.816
2821	2900.0	26.65	*	11.568	15.537	15.402	85.026	15.036	94.396	1.152	2.049	44.041	27.158	-25.097	22.158	17.087
117	2910.0	26.25	*	11.563	15.527	15.171	84.790	15.048	104.256	1.166	1.956	44.045	21.156	-35.423	19.507	14.692
	2920.0	24.28	*	11.557	15.518	15.001	84.613	15.056	114.116	1.177	1.858	44.048	15.302	-47.567	17.229	12.722
	2930.0	22.84	*	11.552	15.507	14.891	84.493	15.056	123.976	1.184	1.756	44.048	9.604	-61.720	15.512	11.283
	2940.0	22.01	*	11.544	15.493	14.841	84.426	15.047	133.836	1.188	1.651	44.045	4.068	-77.561	14.505	10.462
	2950.0	21.83	*	11.533	15.474	14.848	84.407	15.029	143.696	1.188	1.000	44.039	-1.305	265.977	14.292	10.292
	2960.0	22.25	*	11.519	15.449	14.909	84.432	14.999	153.556	1.185	0.988	44.029	-6.511	250.341	14.840	10.733
	2970.0	23.19	*	11.502	15.417	15.020	84.496	14.959	163.416	1.179	0.963	44.015	-11.552	236.572	16.000	11.688
	2980.0	24.51	*	11.481	15.378	15.178	84.596	14.907	173.276	1.171	0.926	44.007	-16.430	224.969	17.589	13.029
	2990.0	26.09	*	11.455	15.331	15.378	84.726	14.845	183.136	1.160	0.879	43.976	-21.151	215.322	19.447	14.639
ECATE	TTIME	CV	SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	CV SUM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	DV1
2871 67	2900.0	28.45	*	11.397	15.223	15.745	*	84.933	14.709	94.695	1.143	2.058	43.931	27.266	*	-24.754	22.162	17.054
	2960.0	26.05	*	11.392	15.214	15.509	*	84.692	14.723	104.555	1.156	1.965	43.935	21.290	*	-34.993	19.472	14.661
	2970.0	24.07	*	11.387	15.205	15.335	*	84.512	14.731	114.415	1.167	1.867	43.938	15.460	*	-47.041	17.187	12.686
	2980.0	22.62	*	11.381	15.195	15.222	*	84.389	14.732	124.275	1.174	1.765	43.939	9.784	*	-61.108	15.453	11.235
	2990.0	21.77	*	11.374	15.187	15.168	*	84.319	14.725	134.135	1.177	1.659	43.936	4.266	*	-76.901	14.419	10.394
	3000.0	21.56	*	11.364	15.163	15.173	*	84.298	14.708	143.995	1.177	1.000	43.930	-1.091	*	266.618	14.177	10.199
	3010.0	21.97	*	11.351	15.139	15.232	*	84.322	14.679	153.855	1.175	0.989	43.921	-6.284	*	250.905	14.695	10.616
	3020.0	22.89	*	11.335	15.109	15.343	*	84.385	14.640	163.715	1.169	0.964	43.908	-11.315	*	237.036	15.833	11.549
	3030.0	24.13	*	11.314	15.071	15.500	*	84.485	14.591	173.575	1.161	0.928	43.891	-16.187	*	225.338	17.407	12.873
3040.0	25.76	*	11.291	15.027	15.701	*	84.615	14.530	183.435	1.151	0.881	43.871	-20.905	*	215.615	19.256	14.471	
2921 17	3000.0	28.26	*	11.223	14.920	16.091	*	84.839	14.394	94.994	1.134	2.067	43.826	27.367	*	-24.429	22.127	17.023
	3010.0	25.06	*	11.229	14.911	15.850	*	84.594	14.408	104.854	1.147	1.974	43.831	21.416	*	-34.584	19.440	14.632
	3020.0	23.88	*	11.224	14.903	15.671	*	84.409	14.417	114.714	1.157	1.876	43.834	15.610	*	-46.540	17.148	12.653
	3030.0	22.41	*	11.214	14.893	15.554	*	84.283	14.419	124.574	1.163	1.773	43.835	9.954	*	-60.521	15.358	11.390
	3040.0	21.54	*	11.212	14.880	15.498	*	84.211	14.413	134.434	1.167	1.667	43.832	4.955	*	-76.266	14.340	10.130
	3050.0	21.32	*	11.203	14.863	15.500	*	84.188	14.397	144.294	1.167	1.000	43.827	-0.886	*	261.239	14.068	10.113
	3060.0	21.73	*	11.191	14.840	15.558	*	84.210	14.370	154.154	1.165	0.990	43.818	-6.067	*	251.452	14.559	10.506
	3070.0	22.59	*	11.175	14.811	15.668	*	84.273	14.332	164.014	1.160	0.966	43.806	-11.089	*	237.486	15.675	11.148
	3080.0	23.88	*	11.156	14.775	15.825	*	84.372	14.284	173.874	1.152	0.929	43.790	-15.955	*	225.697	17.233	12.726
3090.0	25.44	*	11.133	14.732	16.028	*	84.504	14.225	183.734	1.143	0.883	43.771	-20.669	*	215.895	19.073	14.311	
2971 33	3000.0	28.07	*	11.074	14.627	16.439	*	84.743	14.088	95.293	1.126	2.076	43.727	27.462	*	-24.121	22.094	16.993
	3010.0	25.88	*	11.173	14.618	16.143	*	84.493	14.103	105.153	1.138	1.983	43.732	21.537	*	-34.196	19.440	14.632
	3020.0	23.69	*	11.065	14.610	16.010	*	84.305	14.113	115.013	1.147	1.884	43.735	15.753	*	-46.062	17.112	12.622
	3030.0	22.21	*	11.064	14.601	15.890	*	84.176	14.116	124.873	1.154	1.781	43.736	10.118	*	-59.955	15.347	11.148
	3040.0	21.33	*	11.058	14.589	15.830	*	84.101	14.111	134.733	1.157	1.675	43.734	4.636	*	-75.655	14.266	10.270
	3100.0	21.00	*	11.045	14.573	15.837	*	84.076	14.095	144.593	1.158	1.000	43.729	-0.690	*	267.838	13.766	10.031
	3110.0	21.44	*	11.038	14.551	15.887	*	84.097	14.070	154.453	1.155	0.990	43.721	-5.859	*	251.983	14.430	10.402
	3120.0	22.32	*	11.023	14.523	15.946	*	84.159	14.033	164.313	1.150	0.967	43.709	-10.872	*	237.924	15.524	11.294
	3130.0	23.59	*	11.005	14.488	16.154	*	84.258	13.986	174.173	1.144	0.931	43.694	-15.732	*	226.045	17.068	12.585
3140.0	25.14	*	10.983	14.447	16.357	*	84.390	13.929	184.033	1.135	0.885	43.676	-20.443	*	216.175	18.898	14.159	
3021 83	3100.0	27.89	*	10.930	14.343	16.789	*	84.646	13.792	95.592	1.118	2.085	43.632	27.552	*	-23.825	22.063	16.965
	3110.0	25.51	*	10.925	14.335	16.539	*	84.392	13.808	105.452	1.130	1.991	43.637	21.650	*	-33.827	19.360	14.580
	3120.0	23.51	*	10.921	14.327	16.352	*	84.200	13.819	115.312	1.138	1.892	43.641	15.889	*	-45.607	17.078	12.594
	3130.0	22.03	*	10.917	14.319	16.227	*	84.067	13.822	125.172	1.145	1.789	43.642	10.273	*	-59.422	15.300	11.109
	3140.0	21.13	*	10.911	14.307	16.165	*	83.990	13.818	135.032	1.148	1.683	43.640	4.808	*	-75.068	14.196	10.215
	3150.0	20.06	*	10.903	14.292	16.163	*	83.963	13.803	144.892	1.148	1.000	43.636	-0.503	*	268.417	13.869	9.955
	3160.0	21.20	*	10.892	14.271	16.218	*	83.963	13.779	154.752	1.146	0.991	43.628	-5.660	*	252.498	14.368	10.304
	3170.0	22.05	*	10.878	14.244	16.326	*	84.044	13.744	164.612	1.142	0.968	43.617	-10.664	*	238.349	15.381	11.176
	3180.0	23.31	*	10.861	14.210	16.484	*	84.143	13.698	174.472	1.135	0.933	43.603	-15.518	*	226.383	16.911	12.452
3190.0	24.85	*	10.840	14.171	16.688	*	84.276	13.642	184.332	1.127	0.887	43.585	-20.227	*	216.441	18.732	14.014	
ECATE	TTIME	CV SUM	*	DV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	*	PHI1	VINF1	DV1

ECATE	TIME	CV SUM *	CV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1
2755	2870.0	27.51 *	11.811	15.975	15.047 *	84.247	15.480	90.380	1.158	2.069	44.195	29.259 *	-22.135	23.319	18.101
183	2870.0	27.55 *	11.807	15.964	14.801 *	84.994	15.493	100.240	1.175	1.979	44.199	23.167 *	-31.999	20.504	15.571
	2870.0	27.24 *	11.795	15.954	14.614 *	84.801	15.502	110.100	1.198	1.883	44.202	17.224 *	-43.568	18.064	13.437
	2870.0	27.67 *	11.792	15.943	14.488 *	84.665	15.503	119.960	1.197	1.782	44.203	11.437 *	-57.112	16.142	11.806
	2870.0	27.55 *	11.784	15.923	14.421 *	84.583	15.497	120.820	1.203	1.678	44.201	5.813 *	-72.505	14.852	10.776
	2870.0	27.17 *	11.775	15.911	14.411 *	84.550	15.480	130.680	1.204	1.572	44.195	0.357 *	-88.906	14.427	10.400
	2870.0	27.47 *	11.764	15.866	14.455 *	84.562	15.453	140.540	1.202	0.993	44.185	-4.930 *	-255.082	14.749	10.660
	2900.0	27.27 *	11.744	15.855	14.549 *	84.614	15.415	150.400	1.196	0.972	44.172	-10.046 *	-240.685	15.740	11.472
	2910.0	27.43 *	11.723	15.817	14.670 *	84.701	15.365	160.260	1.188	0.938	44.155	-14.994 *	-228.432	17.217	12.712
	2920.0	27.95 *	11.697	15.770	14.975 *	84.820	15.304	170.120	1.177	0.894	44.134	-19.778 *	-218.220	19.008	14.255
2788	2860.0	27.77 *	11.684	15.757	15.383 *	85.296	15.244	86.962	1.145	2.107	44.113	31.594 *	-18.655	24.393	19.081
150	2870.0	27.12 *	11.682	15.745	15.112 *	85.018	15.258	96.823	1.162	2.019	44.118	25.470 *	-27.934	21.474	16.436
	2880.0	27.82 *	11.677	15.735	14.901 *	84.800	15.269	106.682	1.176	1.925	44.121	19.489 *	-38.772	18.880	14.144
	2890.0	27.90 *	11.672	15.726	14.749 *	84.641	15.274	116.543	1.187	1.826	44.123	13.660 *	-51.510	16.743	12.310
	2900.0	27.70 *	11.665	15.714	14.658 *	84.538	15.271	126.402	1.193	1.723	44.122	7.991 *	-66.225	15.215	11.039
	2910.0	27.06 *	11.657	15.698	14.625 *	84.486	15.260	136.263	1.196	1.617	44.118	2.485 *	-82.383	14.434	10.405
	2920.0	27.07 *	11.645	15.676	14.648 *	84.480	15.237	146.122	1.195	0.998	44.110	-2.853 *	-261.263	14.453	10.421
	2930.0	27.67 *	11.625	15.648	14.724 *	84.517	15.204	155.983	1.191	0.982	44.099	-8.023 *	-246.112	15.199	11.027
	2940.0	27.17 *	11.610	15.614	14.848 *	84.592	15.160	165.842	1.184	0.953	44.084	-13.026 *	-232.986	16.565	12.110
	2950.0	27.13 *	11.587	15.571	15.017 *	84.700	15.104	175.703	1.174	0.913	44.065	-17.866 *	-221.994	18.169	13.544
2838	2900.0	27.91 *	11.506	15.424	15.453 *	84.925	14.925	97.122	1.153	2.028	44.003	25.589 *	-27.557	21.437	16.403
100	2910.0	27.61 *	11.501	15.415	15.236 *	84.703	14.937	106.982	1.166	1.934	44.007	19.634 *	-38.302	18.843	14.111
	2920.0	27.77 *	11.496	15.406	15.041 *	84.540	14.943	116.842	1.176	1.834	44.010	13.829 *	-50.942	16.695	12.270
	2930.0	27.47 *	11.490	15.394	14.986 *	84.434	14.941	126.702	1.182	1.731	44.009	8.181 *	-65.577	15.146	10.983
	2940.0	27.01 *	11.482	15.379	14.950 *	84.379	14.930	136.562	1.185	1.625	44.005	2.694 *	-81.705	14.337	10.327
	2970.0	27.79 *	11.470	15.359	14.971 *	84.372	14.910	146.422	1.184	0.998	43.998	-2.629 *	-261.901	14.325	10.318
	2980.0	27.35 *	11.456	15.333	15.045 *	84.407	14.878	156.282	1.180	0.983	43.987	-7.787 *	-246.660	15.043	10.899
	2990.0	27.40 *	11.438	15.299	15.169 *	84.481	14.835	166.142	1.174	0.955	43.973	-12.781 *	-233.431	16.328	11.961
	3000.0	27.80 *	11.416	15.259	15.338 *	84.589	14.781	176.002	1.165	0.915	43.955	-17.615 *	-222.348	17.998	13.379
	3010.0	27.43 *	11.390	15.211	15.549 *	84.727	14.717	185.862	1.154	0.866	43.933	-22.294 *	-213.135	19.903	15.039
2888	2970.0	27.71 *	11.338	15.114	15.795 *	84.830	14.603	97.421	1.143	2.037	43.895	25.701 *	-27.198	21.403	16.372
50	2980.0	27.41 *	11.332	15.105	15.574 *	84.604	14.616	107.281	1.156	1.942	43.899	19.772 *	-37.854	18.808	14.080
	2990.0	27.56 *	11.328	15.097	15.415 *	84.438	14.622	117.141	1.165	1.843	43.902	13.990 *	-50.400	16.650	12.232
	3000.0	27.25 *	11.322	15.086	15.316 *	84.328	14.622	127.001	1.171	1.740	43.902	8.362 *	-64.956	15.083	10.931
	3010.0	27.57 *	11.315	15.072	15.278 *	84.271	14.612	136.861	1.174	1.633	43.898	2.893 *	-81.052	14.246	10.254
	3020.0	27.53 *	11.304	15.052	15.297 *	84.262	14.592	146.721	1.173	0.998	43.892	-2.414 *	-262.520	14.204	10.221
	3030.0	27.07 *	11.291	15.027	15.369 *	84.296	14.562	156.581	1.170	0.984	43.882	-7.560 *	-247.193	14.855	10.778
	3040.0	27.09 *	11.274	14.995	15.493 *	84.370	14.520	166.441	1.164	0.956	43.868	-12.546 *	-233.864	16.159	11.820
	3050.0	27.48 *	11.253	14.956	15.662 *	84.478	14.468	176.301	1.156	0.917	43.851	-17.374 *	-222.692	17.815	13.223
	3060.0	27.10 *	11.228	14.910	15.875 *	84.617	14.405	186.161	1.145	0.868	43.830	-22.051 *	-213.406	19.712	14.872
2938	3020.0	27.52 *	11.177	14.815	16.141 *	84.734	14.291	97.720	1.135	2.046	43.792	25.807 *	-26.859	21.370	16.343
C	3030.0	27.22 *	11.173	14.806	15.915 *	84.504	14.304	107.580	1.146	1.951	43.797	19.902 *	-37.429	18.775	14.052
	3040.0	27.37 *	11.168	14.798	15.751 *	84.334	14.312	117.440	1.155	1.852	43.799	14.143 *	-49.883	16.609	12.198
	3050.0	27.05 *	11.163	14.788	15.649 *	84.221	14.312	127.300	1.161	1.748	43.799	8.536 *	-64.360	15.024	10.883
	3060.0	27.34 *	11.156	14.774	15.608 *	84.162	14.304	137.160	1.164	1.641	43.797	3.084 *	-80.422	14.160	10.186
	3070.0	27.23 *	11.146	14.756	15.624 *	84.151	14.285	147.020	1.163	0.999	43.791	-2.209 *	-263.118	14.089	10.130
	3080.0	27.60 *	11.132	14.732	15.696 *	84.184	14.256	156.880	1.160	0.985	43.781	-7.344 *	-247.710	14.754	10.664
	3090.0	27.80 *	11.117	14.701	15.819 *	84.257	14.216	166.740	1.155	0.958	43.768	-12.321 *	-234.284	15.959	11.687
	3100.0	27.17 *	11.097	14.664	15.989 *	84.365	14.165	176.600	1.147	0.919	43.751	-17.144 *	-223.026	17.642	13.074
	3110.0	27.79 *	11.074	14.620	16.202 *	84.504	14.104	186.460	1.137	0.870	43.732	-21.819 *	-213.673	19.531	14.712
ECATE	TIME	CV SUM *	CV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1

TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	CV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
2988	3070.0	27.34 *	11.024	14.525	16.438	84.636	13.989	98.019	1.126	2.055	43.695	25.907	-26.537	21.339	16.315
317	3080.0	25.05 *	11.020	14.517	16.258	84.402	14.003	107.879	1.138	1.960	43.699	20.026	-37.024	18.744	14.025
	3090.0	23.18 *	11.016	14.509	16.090	84.229	14.012	117.739	1.146	1.860	43.702	14.289	-48.389	16.571	12.165
	3100.0	21.85 *	11.011	14.499	15.984	84.113	14.013	127.599	1.152	1.756	43.702	8.701	-63.789	14.968	10.838
	3110.0	21.13 *	11.004	14.487	15.940	84.051	14.005	137.459	1.154	1.649	43.700	3.266	-75.815	14.061	10.123
	3120.0	21.04 *	10.995	14.469	15.955	84.038	13.987	147.319	1.154	0.999	43.694	-2.013	-263.697	13.962	10.044
	3130.0	21.54 *	10.983	14.446	16.025	84.070	13.959	157.179	1.151	0.986	43.685	-7.136	-248.212	14.621	10.557
	3140.0	22.33 *	10.968	14.417	16.147	84.142	13.920	167.039	1.146	0.959	43.673	-12.105	-234.693	15.846	11.560
	3150.0	23.89 *	10.945	14.381	16.318	84.251	13.871	176.899	1.139	0.920	43.657	-16.924	-223.345	17.476	12.932
	3160.0	25.49 *	10.927	14.338	16.533	84.391	13.811	186.759	1.130	0.872	43.638	-21.596	-213.925	19.358	14.560
3038	3170.0	27.17 *	10.876	14.245	16.836	84.538	13.696	98.318	1.119	2.063	43.602	26.001	-26.231	21.309	16.288
267	3130.0	24.87 *	10.874	14.237	16.603	84.299	13.711	108.178	1.129	1.968	43.607	20.144	-36.640	18.715	14.000
	3140.0	23.01 *	10.871	14.229	16.431	84.127	13.720	118.038	1.137	1.868	43.610	14.428	-48.919	16.535	12.135
	3150.0	21.66 *	10.866	14.220	16.322	84.003	13.722	127.898	1.143	1.764	43.610	8.859	-63.243	14.917	10.796
	3160.0	20.92 *	10.860	14.208	16.275	83.939	13.715	137.758	1.145	1.657	43.608	3.440	-79.232	14.006	10.063
	3170.0	20.81 *	10.851	14.191	16.268	83.924	13.699	147.618	1.145	0.999	43.603	-1.825	-264.257	13.880	9.963
	3180.0	21.29 *	10.840	14.169	16.357	83.955	13.672	157.478	1.142	0.986	43.594	-6.938	-248.698	14.455	10.455
	3190.0	22.27 *	10.825	14.141	16.479	84.027	13.634	167.338	1.137	0.960	43.583	-11.899	-235.089	15.762	11.440
	3200.0	23.61 *	10.807	14.104	16.650	84.135	13.586	177.198	1.131	0.922	43.568	-16.712	-223.663	17.319	12.798
	3210.0	25.20 *	10.786	14.066	16.866	84.276	13.528	187.058	1.122	0.874	43.549	-21.383	-214.177	19.193	14.416
3088	3170.0	27.00 *	10.735	13.973	17.191	84.437	13.412	98.617	1.111	2.072	43.514	26.090	-25.942	21.281	16.263
217	3140.0	24.71 *	10.735	13.766	16.951	84.194	13.428	108.477	1.121	1.977	43.518	20.255	-36.275	18.688	13.976
	3170.0	22.84 *	10.732	13.959	16.775	84.014	13.438	118.337	1.129	1.876	43.522	14.560	-48.470	16.502	12.107
	3200.0	21.48 *	10.727	13.950	16.662	83.892	13.441	128.197	1.134	1.772	43.522	9.009	-62.720	14.869	10.757
	3210.0	20.73 *	10.721	13.938	16.613	83.825	13.434	138.057	1.137	1.665	43.520	3.606	-78.671	13.936	10.007
	3220.0	20.60 *	10.713	13.922	16.623	83.809	13.419	147.917	1.137	0.999	43.516	-1.646	-264.797	13.784	9.887
	3230.0	21.06 *	10.707	13.901	16.691	83.839	13.393	157.777	1.134	0.987	43.508	-6.748	-245.165	14.276	10.359
	3240.0	22.02 *	10.685	13.874	16.813	83.910	13.357	167.637	1.130	0.961	43.496	-11.701	-235.473	15.564	11.326
	3250.0	23.34 *	10.672	13.841	16.934	84.018	13.310	177.497	1.123	0.924	43.482	-16.510	-223.967	17.169	12.671
	3260.0	24.93 *	10.652	13.802	17.202	84.161	13.253	187.357	1.115	0.876	43.465	-21.179	-214.416	19.35	14.279
3138	3270.0	26.85 *	10.606	13.711	17.546	84.335	13.137	98.917	1.104	2.080	43.430	26.173	-25.669	21.254	16.239
167	3270.0	24.55 *	10.603	13.703	17.301	84.088	13.153	108.777	1.114	1.985	43.434	20.361	-35.928	18.663	13.954
	3280.0	22.68 *	10.594	13.696	17.121	83.904	13.164	118.637	1.121	1.884	43.438	14.685	-48.043	16.471	12.081
	3290.0	21.37 *	10.595	13.688	17.005	83.779	13.167	128.497	1.126	1.780	43.439	9.152	-62.220	14.824	10.721
	3300.0	20.54 *	10.590	13.677	16.953	83.710	13.162	138.357	1.128	1.672	43.437	3.765	-78.133	13.870	9.955
	3310.0	20.41 *	10.582	13.662	16.961	83.692	13.147	148.217	1.128	0.999	43.433	-1.475	-265.319	13.694	9.816
	3320.0	20.84 *	10.572	13.642	17.028	83.721	13.122	158.077	1.126	0.988	43.425	-6.566	-249.624	14.263	10.268
	3330.0	21.72 *	10.555	13.616	17.149	83.792	13.087	167.937	1.122	0.962	43.414	-11.513	-235.844	15.433	11.218
	3340.0	23.09 *	10.543	13.584	17.321	83.900	13.041	177.797	1.116	0.925	43.401	-16.317	-224.261	17.126	12.549
	3350.0	24.67 *	10.524	13.546	17.540	84.043	12.986	187.657	1.107	0.878	43.384	-20.984	-214.648	18.885	14.148
3188	3270.0	26.69 *	10.475	13.456	17.933	84.232	12.870	98.216	1.058	2.089	43.349	26.251	-25.410	21.227	16.215
117	3270.0	24.41 *	10.474	13.447	17.654	83.980	12.887	108.076	1.107	1.993	43.354	20.460	-35.595	18.638	13.933
	3280.0	22.53 *	10.474	13.442	17.470	83.793	12.898	118.936	1.114	1.892	43.358	14.804	-47.637	16.442	12.057
	3300.0	21.16 *	10.465	13.434	17.351	83.665	12.902	128.796	1.118	1.787	43.359	9.289	-61.742	14.782	10.687
	3310.0	20.37 *	10.464	13.424	17.295	83.594	12.898	138.656	1.121	1.680	43.358	3.916	-77.616	13.808	9.906
	3320.0	20.20 *	10.458	13.409	17.332	83.574	12.884	148.516	1.121	1.000	43.354	-1.311	-265.821	13.608	9.748
	3330.0	20.63 *	10.447	13.391	17.367	83.601	12.863	158.376	1.119	0.988	43.346	-6.393	-250.064	14.155	10.182
	3340.0	21.55 *	10.434	13.365	17.438	83.672	12.825	168.236	1.115	0.963	43.336	-11.332	-236.203	15.308	11.116
	3350.0	22.85 *	10.415	13.334	17.661	83.781	12.781	178.096	1.109	0.927	43.323	-16.132	-224.545	16.889	12.434
	3360.0	24.42 *	10.401	13.294	17.852	83.925	12.727	187.956	1.102	0.880	43.307	-20.797	-214.871	18.742	14.023
ECATE	TTIME	CV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

EDATE	TIME	DV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
3238 67	3320.0	26.55	10.358	13.210	18.263	84.127	12.610	99.515	1.092	2.097	43.273	26.324	-25.165	21.202	16.192	
	3330.0	24.27	10.355	13.202	18.009	83.871	12.628	109.375	1.100	2.001	43.278	20.554	-35.287	18.615	13.913	
	3340.0	22.38	10.352	13.196	17.821	83.680	12.640	119.235	1.107	1.900	43.282	14.917	-47.250	16.414	12.033	
	3350.0	21.00	10.348	13.189	17.698	83.549	12.644	129.095	1.111	1.795	43.283	9.418	-61.286	14.742	10.655	
	3360.0	20.20	10.342	13.178	17.641	83.475	12.641	138.955	1.113	1.687	43.282	4.061	-71.120	13.749	9.860	
	3370.0	20.02	10.336	13.165	17.645	83.454	12.628	148.815	1.113	1.000	43.278	-1.154	266.304	13.527	9.685	
	3380.0	20.43	10.327	13.146	17.710	83.481	12.604	158.675	1.111	0.989	43.271	-6.227	250.489	14.053	10.101	
	3390.0	21.33	10.315	13.122	17.830	83.551	12.571	168.535	1.108	0.964	43.262	-11.159	236.550	15.150	11.019	
	3400.0	22.63	10.301	13.092	18.004	83.660	12.528	178.395	1.103	0.929	43.249	-15.955	224.819	16.759	12.324	
	3410.0	24.19	10.284	13.057	18.276	83.805	12.475	188.255	1.096	0.881	43.234	-20.619	215.085	18.605	13.905	
3288 17	3370.0	26.41	10.242	12.970	18.626	84.020	12.358	99.814	1.086	2.105	43.200	26.392	-24.934	21.177	16.170	
	3380.0	24.13	10.239	12.963	18.367	83.760	12.376	109.674	1.094	2.003	43.206	20.643	-34.991	18.592	13.893	
	3390.0	22.25	10.236	12.957	18.175	83.565	12.389	119.534	1.100	1.907	43.209	15.024	-46.882	16.388	12.011	
	3400.0	20.86	10.232	12.950	18.049	83.432	12.394	129.394	1.104	1.802	43.211	9.542	-60.851	14.705	10.624	
	3410.0	20.04	10.228	12.940	17.988	83.356	12.391	139.254	1.106	1.694	43.210	4.198	-76.645	13.654	9.816	
	3420.0	19.85	10.221	12.927	17.991	83.333	12.379	149.114	1.106	1.000	43.206	-1.005	266.769	13.451	9.625	
	3430.0	20.24	10.213	12.909	18.054	83.358	12.356	158.974	1.105	0.989	43.200	-6.068	250.859	13.956	10.023	
	3440.0	21.13	10.202	12.886	18.175	83.428	12.324	168.834	1.101	0.965	43.191	-10.994	236.885	15.077	10.926	
	3450.0	22.41	10.188	12.858	18.349	83.538	12.282	178.694	1.096	0.929	43.179	-15.785	225.083	16.636	12.220	
	3460.0	23.96	10.172	12.824	18.573	83.683	12.230	188.554	1.090	0.883	43.164	-20.448	215.292	18.475	13.792	
3338 33	3400.0	26.23	10.131	12.739	18.991	83.912	12.114	109.113	1.080	2.113	43.131	26.456	-24.715	21.153	16.149	
	3410.0	24.00	10.128	12.732	18.728	83.648	12.132	109.973	1.088	2.016	43.136	20.726	-34.710	18.571	13.874	
	3420.0	22.12	10.125	12.726	18.531	83.449	12.145	119.833	1.093	1.915	43.140	15.125	-46.532	16.363	11.990	
	3430.0	20.72	10.122	12.719	18.402	83.313	12.151	129.693	1.097	1.809	43.142	9.659	-60.435	14.670	10.596	
	3440.0	19.80	10.117	12.709	18.339	83.234	12.149	139.553	1.099	1.701	43.141	4.329	-76.190	13.642	9.775	
	3450.0	19.80	10.111	12.697	18.340	83.210	12.137	149.413	1.100	1.000	43.138	-0.863	267.217	13.378	9.568	
	3460.0	20.05	10.103	12.679	18.402	83.234	12.115	159.273	1.098	0.990	43.132	-5.917	251.294	13.864	9.950	
	3470.0	20.93	10.092	12.657	18.523	83.304	12.084	169.133	1.095	0.966	43.123	-10.836	237.208	14.969	10.839	
	3480.0	22.21	10.080	12.630	18.677	83.414	12.043	178.993	1.090	0.930	43.111	-15.624	225.338	16.517	12.120	
	3490.0	23.75	10.064	12.597	18.923	83.561	11.992	188.853	1.085	0.884	43.097	-20.285	215.491	18.351	13.684	
3388 83	3470.0	26.15	10.025	12.514	19.358	83.802	11.876	109.412	1.075	2.121	43.065	26.515	-24.509	21.129	16.127	
	3480.0	23.88	10.022	12.507	19.091	83.534	11.895	119.272	1.082	2.024	43.070	20.804	-34.445	18.550	13.856	
	3490.0	21.50	10.019	12.501	18.890	83.332	11.908	129.132	1.087	1.922	43.074	15.221	-46.200	16.439	11.970	
	3500.0	20.55	10.016	12.494	18.758	83.192	11.914	139.992	1.091	1.816	43.076	9.770	-60.040	14.637	10.569	
	3510.0	19.75	10.012	12.485	18.692	83.112	11.913	150.852	1.093	1.707	43.075	4.453	-75.755	13.593	9.736	
	3520.0	19.52	10.006	12.473	18.691	83.085	11.902	160.712	1.093	1.000	43.072	-0.727	267.646	13.310	9.514	
	3530.0	19.88	9.996	12.456	18.752	83.107	11.881	170.572	1.092	0.990	43.066	-5.773	251.673	13.777	9.881	
	3540.0	20.74	9.985	12.435	18.873	83.178	11.850	180.432	1.089	0.967	43.058	-10.685	237.519	14.867	10.755	
	3550.0	22.00	9.977	12.409	19.044	83.288	11.810	190.292	1.085	0.932	43.047	-15.469	225.582	16.405	12.026	
	3560.0	23.54	9.961	12.377	19.276	83.437	11.760	199.152	1.079	0.886	43.033	-20.129	215.682	18.232	13.581	
EDATE	TIME	DV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1



TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

DATE	TIME	CV	SUM *	CV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1
3122	3200.0	27.82	*	10.651	13.799	17.535	* 84.475	13.219	95.200	1.103	2.111	43.454	28.316	* -22.374	22.290	17.169
183	3210.0	25.40	*	10.647	13.791	17.268	* 84.206	13.237	105.060	1.113	2.018	43.460	22.447	* -32.068	19.562	14.757
	3220.0	23.37	*	10.643	13.784	17.066	* 84.000	13.249	114.920	1.121	1.919	43.464	16.714	* -42.488	17.229	12.722
	3230.0	21.80	*	10.635	13.776	16.928	* 83.895	13.255	124.780	1.127	1.816	43.466	11.122	* -52.935	15.368	11.165
	3240.0	20.61	*	10.634	13.766	16.853	* 83.767	13.253	134.640	1.130	1.710	43.465	5.676	* -62.315	14.150	10.178
	3250.0	20.44	*	10.627	13.752	16.840	* 83.731	13.242	144.500	1.131	1.601	43.461	0.378	* -72.801	13.653	9.815
	3260.0	20.68	*	10.618	13.734	16.886	* 83.744	13.220	154.360	1.130	0.993	43.455	-4.772	* -82.5045	14.009	10.065
	3270.0	21.46	*	10.606	13.710	16.988	* 83.800	13.188	164.220	1.126	0.973	43.445	-9.774	* -92.516	14.985	10.852
	3280.0	22.05	*	10.591	13.679	17.142	* 83.895	13.146	174.080	1.121	0.940	43.432	-14.631	* -102.161	16.447	12.062
	3290.0	24.15	*	10.572	13.643	17.344	* 84.026	13.094	183.940	1.114	0.896	43.417	-19.349	* -112.850	18.227	13.577
3156	3240.0	26.15	*	10.561	13.619	17.598	* 84.227	13.048	191.642	1.105	2.058	43.403	24.644	* -28.139	20.524	15.589
150	3250.0	23.96	*	10.557	13.612	17.369	* 83.996	13.063	111.503	1.113	1.961	43.407	18.875	* -38.832	18.026	13.404
	3260.0	22.21	*	10.554	13.605	17.204	* 83.825	13.072	121.362	1.120	1.860	43.410	13.243	* -48.462	15.962	11.656
	3270.0	20.99	*	10.545	13.597	17.104	* 83.716	13.074	131.223	1.124	1.754	43.411	7.755	* -58.141	14.481	10.443
	3280.0	20.38	*	10.543	13.585	17.067	* 83.660	13.066	141.082	1.126	1.646	43.408	2.412	* -67.350	13.722	9.838
	3290.0	20.50	*	10.535	13.569	17.091	* 83.654	13.049	150.943	1.125	0.998	43.403	-2.784	* -76.176	13.444	9.856
	3300.0	20.97	*	10.525	13.547	17.172	* 83.694	13.022	160.802	1.123	0.982	43.395	-7.834	* -85.895	14.483	10.445
	3310.0	22.01	*	10.511	13.520	17.307	* 83.776	12.984	170.663	1.118	0.954	43.384	-12.740	* -95.671	15.777	11.503
	3320.0	23.41	*	10.495	13.487	17.443	* 83.834	12.937	180.522	1.112	0.914	43.369	-17.506	* -105.621	17.451	12.911
	3330.0	25.04	*	10.477	13.448	17.724	* 84.046	12.879	190.383	1.104	0.865	43.352	-22.138	* -115.447	19.359	14.561
3206	3270.0	26.00	*	10.430	13.368	17.955	* 84.122	12.784	191.342	1.098	2.067	43.324	24.726	* -27.868	20.459	15.567
100	3300.0	23.07	*	10.432	13.361	17.721	* 83.866	12.800	111.802	1.106	1.969	43.329	18.978	* -38.488	18.002	13.383
	3310.0	22.06	*	10.425	13.354	17.553	* 83.714	12.809	121.662	1.113	1.867	43.332	13.365	* -48.043	15.931	11.630
	3320.0	20.83	*	10.425	13.345	17.450	* 83.601	12.812	131.522	1.117	1.761	43.332	7.893	* -57.656	14.435	10.406
	3330.0	20.20	*	10.415	13.335	17.410	* 83.542	12.805	141.382	1.118	1.653	43.330	2.564	* -67.183	13.655	9.785
	3340.0	20.20	*	10.417	13.319	17.432	* 83.535	12.789	151.242	1.118	0.998	43.325	-2.620	* -76.165	13.654	9.785
	3350.0	20.76	*	10.402	13.298	17.513	* 83.574	12.762	161.102	1.115	0.983	43.318	-7.661	* -85.309	14.372	10.356
	3360.0	21.79	*	10.385	13.272	17.648	* 83.655	12.726	170.962	1.111	0.955	43.307	-12.560	* -94.005	15.651	11.398
	3370.0	23.17	*	10.371	13.240	17.834	* 83.774	12.679	180.822	1.105	0.916	43.293	-17.323	* -103.884	17.314	12.795
	3380.0	24.79	*	10.355	13.203	18.067	* 83.927	12.623	190.682	1.098	0.866	43.277	-21.954	* -113.654	19.217	14.437
3256	3340.0	25.86	*	10.316	13.124	18.314	* 84.015	12.527	192.241	1.092	2.075	43.249	24.803	* -27.611	20.475	15.545
50	3350.0	23.68	*	10.313	13.117	18.075	* 83.776	12.544	112.101	1.100	1.977	43.254	19.075	* -38.163	17.978	13.363
	3360.0	21.92	*	10.311	13.111	17.904	* 83.580	12.554	121.961	1.106	1.875	43.257	13.481	* -48.643	15.901	11.606
	3370.0	20.68	*	10.306	13.103	17.795	* 83.463	12.557	131.821	1.109	1.769	43.258	8.024	* -58.192	14.352	10.372
	3380.0	20.04	*	10.301	13.092	17.755	* 83.423	12.551	141.681	1.111	1.667	43.256	2.709	* -67.348	13.552	9.736
	3390.0	20.01	*	10.294	13.077	17.776	* 83.415	12.535	151.541	1.111	0.999	43.251	-2.464	* -76.125	13.569	9.718
	3400.0	20.56	*	10.284	13.057	17.856	* 83.453	12.510	161.401	1.108	0.984	43.244	-7.496	* -85.705	14.267	10.272
	3410.0	21.57	*	10.272	13.032	17.991	* 83.534	12.474	171.261	1.104	0.956	43.234	-12.389	* -95.328	15.531	11.299
	3420.0	22.94	*	10.257	13.001	18.178	* 83.653	12.429	181.121	1.099	0.917	43.221	-17.148	* -105.137	17.184	12.684
	3430.0	24.56	*	10.240	12.965	18.413	* 83.807	12.374	190.981	1.092	0.868	43.205	-21.778	* -114.852	19.081	14.318
3306	3350.0	25.73	*	10.207	12.887	18.676	* 83.987	12.278	192.340	1.086	2.083	43.177	24.875	* -27.368	20.451	15.524
0	3400.0	23.54	*	10.195	12.861	18.434	* 83.663	12.295	112.400	1.093	1.985	43.182	19.167	* -37.854	17.956	13.343
	3410.0	21.78	*	10.191	12.844	18.294	* 83.484	12.306	122.260	1.099	1.882	43.185	13.590	* -48.262	15.873	11.582
	3420.0	20.53	*	10.187	12.827	18.148	* 83.365	12.309	132.120	1.102	1.776	43.186	8.149	* -58.750	14.351	10.339
	3430.0	19.83	*	10.187	12.805	18.104	* 83.303	12.304	141.980	1.104	1.667	43.185	2.848	* -68.878	13.523	9.689
	3440.0	19.03	*	10.181	12.782	18.123	* 83.292	12.289	151.840	1.104	0.998	43.181	-2.314	* -78.512	13.489	9.654
	3450.0	20.36	*	10.171	12.753	18.201	* 83.351	12.265	161.700	1.102	0.984	43.174	-7.338	* -88.095	14.167	10.192
	3460.0	21.57	*	10.160	12.729	18.337	* 83.410	12.230	171.560	1.098	0.957	43.164	-12.225	* -97.635	15.471	11.205
	3470.0	22.72	*	10.146	12.709	18.522	* 83.530	12.185	181.420	1.093	0.918	43.151	-16.981	* -107.382	17.001	12.579
	3480.0	24.34	*	10.125	12.674	18.762	* 83.656	12.131	191.280	1.087	0.870	43.136	-21.610	* -117.044	18.752	14.206
DATE	TIME	CV	SUM *	CV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1

EDATE	TTIME	DV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
3356	3440.0	25.60	10.093	12.658	19.041	83.797	12.036	102.839	1.080	2.090	43.109	24.942	-27.139	20.429	15.504	
317	3450.0	23.41	10.090	12.651	18.794	83.549	12.053	112.699	1.087	1.992	43.114	19.253	-37.561	17.934	13.325	
	3460.0	21.65	10.087	12.645	18.614	83.366	12.064	122.559	1.092	1.890	43.117	13.694	-45.901	15.847	11.560	
	3470.0	20.39	10.084	12.638	18.502	83.245	12.068	132.419	1.096	1.783	43.118	8.268	-64.327	14.313	10.308	
	3480.0	19.72	10.079	12.628	18.455	83.180	12.064	142.279	1.097	1.674	43.117	2.980	-80.427	13.476	9.645	
	3490.0	19.67	10.072	12.614	18.472	83.169	12.050	152.139	1.097	0.999	43.113	-2.172	263.003	13.412	9.594	
	3500.0	20.18	10.064	12.596	18.550	83.205	12.026	161.999	1.095	0.985	43.107	-7.187	247.466	14.072	10.116	
	3510.0	21.17	10.053	12.573	18.685	83.286	11.992	171.859	1.092	0.958	43.097	-12.068	233.939	15.308	11.115	
	3520.0	22.52	10.040	12.544	18.874	83.406	11.949	181.719	1.087	0.920	43.085	-16.821	222.617	16.942	12.479	
	3530.0	24.12	10.024	12.510	19.113	83.563	11.896	191.579	1.081	0.871	43.070	-21.450	213.227	18.828	14.098	
3406	3490.0	25.47	9.989	12.435	19.408	83.686	11.800	103.136	1.075	2.098	43.044	25.005	-26.922	20.406	15.484	
267	3500.0	23.29	9.986	12.429	19.157	83.434	11.818	112.998	1.081	2.000	43.049	19.334	-37.284	17.913	13.307	
	3510.0	21.52	9.983	12.423	18.973	83.247	11.830	122.858	1.086	1.897	43.052	13.792	-49.557	15.821	11.539	
	3520.0	20.26	9.979	12.416	18.858	83.123	11.834	132.718	1.090	1.790	43.053	8.381	-63.925	14.277	10.279	
	3530.0	19.58	9.975	12.406	18.808	83.056	11.830	142.578	1.091	1.680	43.052	3.105	-75.995	13.423	9.603	
	3540.0	19.51	9.969	12.393	18.824	83.043	11.817	152.438	1.091	0.999	43.049	-2.036	263.417	13.339	9.538	
	3550.0	20.00	9.961	12.375	18.901	83.079	11.794	162.298	1.089	0.986	43.042	-7.043	247.824	13.982	10.044	
	3560.0	20.98	9.950	12.353	19.036	83.160	11.761	172.158	1.086	0.959	43.033	-11.919	234.228	15.204	11.030	
	3570.0	22.32	9.938	12.326	19.226	83.281	11.719	182.018	1.081	0.921	43.022	-16.668	222.843	16.830	12.383	
	3580.0	23.92	9.923	12.293	19.467	83.439	11.667	191.878	1.076	0.873	43.008	-21.296	213.403	18.711	13.996	
3456	3540.0	25.35	9.889	12.219	19.778	83.572	11.571	103.437	1.070	2.106	42.982	25.063	-26.718	20.384	15.465	
217	3550.0	23.17	9.886	12.213	19.522	83.316	11.589	113.297	1.076	2.007	42.987	19.410	-37.021	17.853	13.289	
	3560.0	21.40	9.883	12.207	19.335	83.126	11.602	123.157	1.081	1.904	42.990	13.884	-49.230	15.757	11.519	
	3570.0	20.13	9.880	12.200	19.216	82.999	11.607	133.017	1.084	1.797	42.991	8.488	-63.541	14.242	10.252	
	3580.0	19.44	9.875	12.191	19.165	82.931	11.603	142.877	1.085	1.687	42.991	3.224	-79.582	13.373	9.564	
	3590.0	19.35	9.870	12.178	19.178	82.916	11.591	152.737	1.085	0.999	42.987	-1.906	263.814	13.270	9.484	
	3600.0	19.84	9.862	12.161	19.255	82.951	11.568	162.597	1.083	0.986	42.981	-6.906	248.167	13.856	9.976	
	3610.0	20.80	9.852	12.140	19.390	83.032	11.536	172.457	1.080	0.960	42.972	-11.776	234.505	15.105	10.949	
	3620.0	22.13	9.840	12.113	19.582	83.153	11.495	182.317	1.076	0.922	42.961	-16.523	223.060	16.722	12.293	
	3630.0	23.72	9.826	12.082	19.824	83.313	11.444	192.177	1.071	0.874	42.948	-21.150	213.571	18.558	13.898	
3506	3590.0	25.24	9.793	12.009	20.151	83.458	11.348	103.737	1.065	2.113	42.922	25.117	-26.526	20.362	15.445	
167	3600.0	23.06	9.790	12.003	19.890	83.197	11.367	113.597	1.071	2.015	42.927	19.482	-36.773	17.873	13.272	
	3610.0	21.29	9.787	11.997	19.699	83.004	11.380	123.457	1.075	1.911	42.931	13.972	-48.921	15.774	11.500	
	3620.0	20.01	9.784	11.990	19.577	82.874	11.385	133.317	1.078	1.804	42.932	8.590	-63.176	14.210	10.226	
	3630.0	19.31	9.780	11.981	19.523	82.804	11.382	143.177	1.079	1.693	42.931	3.338	-75.188	13.325	9.526	
	3640.0	19.21	9.775	11.969	19.536	82.788	11.370	153.037	1.079	0.999	42.928	-1.783	264.194	13.205	9.433	
	3650.0	19.68	9.767	11.953	19.612	82.822	11.349	162.897	1.078	0.987	42.922	-6.775	248.497	13.114	9.911	
	3660.0	20.63	9.758	11.932	19.747	82.902	11.317	172.757	1.075	0.961	42.914	-11.640	234.771	15.011	10.873	
	3670.0	21.95	9.746	11.907	19.940	83.025	11.276	182.617	1.071	0.923	42.903	-16.384	223.268	16.620	12.206	
	3680.0	23.54	9.733	11.877	20.185	83.186	11.226	192.477	1.066	0.875	42.890	-21.011	213.732	18.451	13.806	
3556	3640.0	25.13	9.701	11.805	20.526	83.341	11.131	104.036	1.060	2.121	42.865	25.166	-26.344	20.341	15.426	
117	3650.0	22.95	9.698	11.799	20.261	83.077	11.150	113.896	1.066	2.022	42.870	19.548	-36.538	17.853	13.255	
	3660.0	21.18	9.695	11.793	20.066	82.880	11.163	123.756	1.070	1.918	42.874	14.054	-46.627	15.752	11.482	
	3670.0	19.89	9.693	11.787	19.941	82.747	11.169	133.616	1.073	1.810	42.875	8.686	-62.828	14.178	10.201	
	3680.0	19.18	9.689	11.778	19.885	82.675	11.167	143.476	1.074	1.699	42.875	3.446	-78.811	13.280	9.491	
	3690.0	19.07	9.684	11.766	19.896	82.657	11.156	153.336	1.074	0.999	42.872	-1.666	264.558	13.143	9.384	
	3700.0	19.53	9.677	11.751	19.971	82.691	11.135	163.196	1.072	0.987	42.866	-6.650	248.813	13.736	9.849	
	3710.0	20.47	9.668	11.731	20.107	82.772	11.104	173.056	1.070	0.961	42.858	-11.511	235.027	14.921	10.799	
	3720.0	21.78	9.657	11.706	20.301	82.895	11.064	182.916	1.066	0.924	42.848	-16.251	223.467	16.522	12.124	
	3730.0	23.36	9.644	11.677	20.548	83.057	11.015	192.776	1.062	0.877	42.835	-20.878	213.886	18.389	13.717	
EDATE	TTIME	DV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	CV	SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
36C6 67	3690.0	25.62	9.613	11.607	20.903	83.223	10.920	104.335	1.056	2.128	42.811	25.211	-26.174	20.319	15.407	
	3700.0	22.85	9.610	11.601	20.635	82.954	10.939	114.195	1.061	2.029	42.816	19.611	-26.317	17.834	13.239	
	3710.0	21.07	9.607	11.595	20.436	82.754	10.953	124.055	1.065	1.925	42.820	14.131	-48.349	15.730	11.464	
	3720.0	19.78	9.605	11.589	20.308	82.619	10.959	133.915	1.067	1.817	42.821	8.776	-42.498	14.149	10.177	
	3730.0	18.06	9.601	11.580	20.250	82.544	10.957	143.775	1.069	1.706	42.821	3.548	-78.452	13.236	9.457	
	3740.0	16.93	9.596	11.569	20.259	82.525	10.947	153.635	1.069	0.999	42.818	-1.555	-264.906	13.064	9.339	
	3750.0	15.38	9.589	11.554	20.333	82.558	10.926	163.495	1.067	0.987	42.813	-6.532	-249.116	13.662	9.791	
	3760.0	20.31	9.581	11.535	20.470	82.639	10.896	173.355	1.065	0.962	42.805	-11.387	-235.271	14.835	10.730	
	3770.0	21.62	9.571	11.511	20.665	82.763	10.857	183.215	1.061	0.925	42.795	-16.125	-223.657	16.429	12.046	
	3780.0	23.19	9.558	11.483	20.914	82.927	10.809	193.075	1.057	0.878	42.783	-20.752	-214.033	18.292	13.633	
3656 17	3740.0	24.42	9.528	11.415	21.284	83.103	10.714	104.634	1.052	2.135	42.759	25.253	-26.014	20.298	15.388	
	3750.0	22.75	9.526	11.408	21.011	82.830	10.734	114.494	1.056	2.036	42.764	19.668	-36.108	17.816	13.223	
	3760.0	20.97	9.523	11.402	20.808	82.626	10.748	124.354	1.060	1.931	42.767	14.204	-48.086	15.709	11.446	
	3770.0	19.67	9.520	11.396	20.677	82.488	10.755	134.214	1.062	1.823	42.769	8.862	-62.185	14.120	10.154	
	3780.0	18.94	9.517	11.388	20.617	82.412	10.753	144.074	1.064	1.712	42.769	3.644	-78.111	13.195	9.425	
	3790.0	18.61	9.512	11.377	20.625	82.392	10.743	153.934	1.064	0.999	42.766	-1.449	-265.239	13.027	9.295	
	3800.0	19.24	9.506	11.363	20.699	82.424	10.723	163.794	1.062	0.988	42.761	-6.419	-245.406	13.552	9.735	
	3810.0	20.16	9.498	11.344	20.835	82.505	10.694	173.654	1.060	0.963	42.754	-11.270	-235.505	14.754	10.664	
	3820.0	21.46	9.488	11.322	21.031	82.629	10.655	183.514	1.057	0.926	42.744	-16.005	-223.838	16.340	11.971	
	3830.0	23.03	9.476	11.294	21.283	82.795	10.506	193.374	1.053	0.879	42.733	-20.631	-214.172	18.199	13.553	
37C6 33	3730.0	24.62	9.447	11.227	21.667	82.981	10.513	104.933	1.048	2.142	42.709	25.290	-25.865	20.277	15.369	
	3800.0	22.65	9.445	11.221	21.389	82.704	10.533	114.793	1.052	2.042	42.714	19.722	-35.911	17.757	13.207	
	3810.0	20.87	9.442	11.215	21.183	82.497	10.548	124.653	1.056	1.938	42.718	14.272	-47.837	15.689	11.429	
	3820.0	19.57	9.440	11.209	21.049	82.356	10.555	134.513	1.058	1.829	42.719	9.943	-61.887	14.093	10.132	
	3830.0	18.83	9.436	11.201	20.987	82.277	10.554	144.373	1.059	1.717	42.719	3.736	-77.786	13.156	9.395	
	3840.0	18.69	9.432	11.191	20.993	82.256	10.544	154.233	1.059	0.999	42.717	-1.349	-265.556	12.974	9.254	
	3850.0	19.11	9.426	11.177	21.067	82.288	10.525	164.093	1.058	0.988	42.712	-6.312	-249.682	13.525	9.683	
	3860.0	20.02	9.418	11.159	21.204	82.369	10.497	173.953	1.056	0.964	42.705	-11.158	-235.728	14.676	10.601	
	3870.0	21.31	9.405	11.137	21.401	82.494	10.459	183.813	1.053	0.927	42.696	-15.891	-224.011	16.255	11.900	
	3880.0	22.87	9.398	11.111	21.654	82.661	10.412	193.673	1.049	0.880	42.684	-20.517	-214.304	18.110	13.476	
3756 83	3840.0	24.72	9.370	11.045	22.052	82.857	10.317	105.232	1.044	2.149	42.661	25.324	-25.725	20.255	15.351	
	3850.0	22.56	9.367	11.039	21.771	82.576	10.338	115.092	1.048	2.049	42.666	19.772	-35.726	17.778	13.191	
	3860.0	20.78	9.365	11.033	21.561	82.366	10.353	124.952	1.051	1.944	42.670	14.335	-47.603	15.669	11.413	
	3870.0	19.47	9.362	11.027	21.424	82.222	10.360	134.812	1.053	1.835	42.672	9.019	-61.606	14.066	10.111	
	3880.0	18.72	9.359	11.020	21.359	82.141	10.360	144.672	1.054	1.723	42.672	3.822	-77.477	13.119	9.366	
	3890.0	18.57	9.355	11.009	21.365	82.119	10.351	154.532	1.054	1.000	42.669	-1.254	-265.858	12.923	9.214	
	3900.0	18.98	9.349	10.996	21.438	82.150	10.332	164.392	1.053	0.989	42.665	-6.211	-245.946	13.461	9.632	
	3910.0	19.88	9.342	10.979	21.575	82.231	10.304	174.252	1.051	0.964	42.658	-11.052	-235.941	14.602	10.541	
	3920.0	21.17	9.333	10.958	21.774	82.358	10.267	184.112	1.049	0.928	42.649	-15.783	-224.176	16.174	11.833	
	3930.0	22.73	9.322	10.932	22.029	82.526	10.221	193.972	1.045	0.881	42.638	-20.408	-214.430	18.226	13.404	
ECATE	TTIME	CV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

ECATE	TIME	CV	SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BFTA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
3489	3570.0	26.16	*	9.825	12.080	20.141	83.608	11.412	100.020	1.064	2.146	42.939	27.200	-23.221	21.358	16.332
183	3580.0	23.86	*	9.822	12.073	19.857	83.323	11.433	109.880	1.070	2.049	42.945	21.515	-32.883	18.755	14.034
	3590.0	21.92	*	9.819	12.067	19.642	83.107	11.448	119.740	1.075	1.947	42.949	15.953	-44.313	16.457	12.103
	3600.0	20.45	*	9.816	12.061	19.495	82.956	11.456	129.600	1.079	1.841	42.951	10.519	-57.816	14.721	10.637
	3610.0	19.54	*	9.812	12.053	19.418	82.864	11.456	139.460	1.081	1.732	42.951	5.215	-73.288	13.577	9.723
	3620.0	19.22	*	9.807	12.042	19.407	82.829	11.447	149.320	1.081	1.620	42.949	0.043	-89.860	13.179	9.412
	3630.0	19.49	*	9.801	12.027	19.460	82.846	11.429	159.180	1.080	0.993	42.944	-4.999	253.954	13.538	9.693
	3640.0	20.29	*	9.792	12.008	19.574	82.910	11.401	169.040	1.078	0.971	42.936	-9.912	235.456	14.543	10.494
	3650.0	21.49	*	9.781	11.984	19.746	83.018	11.363	178.900	1.074	0.938	42.926	-14.701	227.168	16.024	11.707
	3660.0	22.97	*	9.768	11.955	19.971	83.164	11.316	188.760	1.070	0.894	42.914	-19.371	216.971	17.816	13.223
3523	3680.0	27.00	*	9.763	11.944	20.516	83.654	11.255	90.603	1.059	2.185	42.898	29.342	-15.936	22.361	17.233
150	3610.0	24.59	*	9.760	11.936	20.204	83.341	11.278	106.462	1.065	2.090	42.904	23.625	-29.018	19.662	14.827
	3620.0	22.51	*	9.757	11.930	19.961	83.097	11.295	116.323	1.070	1.990	42.908	18.029	-39.715	17.264	12.752
	3630.0	20.86	*	9.754	11.924	19.787	82.920	11.306	126.182	1.074	1.885	42.911	12.558	-52.398	15.291	11.102
	3640.0	19.72	*	9.751	11.917	19.682	82.806	11.310	136.043	1.077	1.777	42.912	7.215	-67.169	13.891	9.971
	3650.0	19.18	*	9.747	11.907	19.645	82.749	11.305	145.902	1.078	1.666	42.911	2.002	-83.478	13.700	9.429
	3660.0	19.23	*	9.741	11.894	19.674	82.747	11.290	155.762	1.077	0.997	42.907	-3.081	254.997	13.277	9.489
	3670.0	19.83	*	9.733	11.877	19.766	82.794	11.266	165.622	1.075	0.981	42.901	-8.037	244.736	14.054	10.101
	3680.0	20.89	*	9.723	11.856	19.918	82.886	11.233	175.482	1.072	0.952	42.892	-12.868	231.584	15.373	11.169
	3690.0	22.29	*	9.712	11.829	20.125	83.019	11.190	185.342	1.068	0.912	42.881	-17.579	220.621	17.62	12.580
3573	3680.0	26.88	*	9.673	11.742	20.895	83.540	11.040	96.902	1.054	2.193	42.842	29.377	-15.792	22.335	17.210
100	3680.0	24.43	*	9.669	11.734	20.579	83.223	11.063	106.762	1.060	2.097	42.848	23.678	-28.827	19.642	14.809
	3670.0	22.40	*	9.666	11.728	20.331	82.975	11.080	116.622	1.065	1.997	42.852	18.099	-39.470	17.245	12.735
	3660.0	20.75	*	9.664	11.722	20.154	82.795	11.092	126.482	1.069	1.892	42.855	12.642	-52.095	15.267	11.082
	3650.0	19.61	*	9.661	11.715	20.046	82.678	11.096	136.342	1.071	1.783	42.856	7.313	-66.817	13.857	9.945
	3700.0	19.05	*	9.657	11.706	20.007	82.620	11.092	146.202	1.072	1.672	42.855	2.111	-83.107	13.151	9.391
	3710.0	19.09	*	9.651	11.694	20.035	82.616	11.078	156.062	1.072	0.997	42.852	-2.964	260.345	13.211	9.438
	3720.0	19.68	*	9.644	11.677	20.127	82.662	11.055	165.922	1.070	0.982	42.846	-7.913	245.032	13.974	10.037
	3730.0	20.73	*	9.635	11.656	20.279	82.754	11.022	175.782	1.067	0.953	42.837	-12.739	231.820	15.282	11.094
	3740.0	22.12	*	9.623	11.631	20.487	82.889	10.980	185.642	1.063	0.913	42.826	-17.448	220.804	16.964	12.497
3623	3700.0	26.77	*	9.586	11.546	21.277	83.425	10.830	97.201	1.050	2.200	42.788	29.407	-15.658	22.310	17.187
50	3710.0	24.37	*	9.582	11.538	20.956	83.103	10.853	107.061	1.056	2.105	42.794	23.727	-28.648	19.621	14.791
	3720.0	22.30	*	9.580	11.532	20.705	82.851	10.872	116.921	1.061	2.004	42.799	18.163	-39.239	17.226	12.719
	3730.0	20.64	*	9.577	11.526	20.524	82.668	10.884	126.781	1.064	1.898	42.802	12.722	-51.807	15.244	11.064
	3740.0	19.49	*	9.574	11.519	20.413	82.548	10.888	136.641	1.066	1.789	42.803	7.405	-66.482	13.824	9.919
	3750.0	18.93	*	9.570	11.511	20.372	82.488	10.884	146.501	1.067	1.678	42.802	2.213	-82.753	13.105	9.355
	3760.0	18.95	*	9.565	11.499	20.399	82.483	10.871	156.361	1.067	0.998	42.799	-2.852	260.679	13.149	9.389
	3770.0	19.53	*	9.558	11.483	20.490	82.529	10.848	166.221	1.065	0.982	42.793	-7.795	245.316	13.857	9.977
	3780.0	20.57	*	9.545	11.462	20.643	82.621	10.816	176.081	1.062	0.954	42.785	-12.617	232.046	15.195	11.023
	3790.0	21.96	*	9.534	11.438	20.853	82.757	10.775	185.941	1.059	0.914	42.774	-17.324	220.979	16.871	12.419
3673	3770.0	26.67	*	9.505	11.356	21.667	83.308	10.626	97.500	1.046	2.207	42.737	29.434	-15.532	22.284	17.164
C	3770.0	24.27	*	9.495	11.347	21.336	82.981	10.649	107.360	1.052	2.112	42.743	23.771	-28.480	19.601	14.774
	3780.0	22.27	*	9.491	11.341	21.081	82.725	10.668	117.220	1.056	2.011	42.748	18.224	-39.020	17.207	12.703
	3790.0	20.54	*	9.484	11.335	20.896	82.538	10.680	127.080	1.059	1.905	42.751	12.796	-51.535	15.222	11.045
	3800.0	19.51	*	9.473	11.329	20.783	82.416	10.685	136.940	1.061	1.796	42.752	7.492	-66.164	13.793	9.894
	3810.0	18.51	*	9.465	11.320	20.740	82.354	10.682	146.800	1.062	1.684	42.751	2.311	-82.415	13.060	9.321
	3820.0	17.53	*	9.457	11.312	20.705	82.294	10.669	156.660	1.062	0.998	42.748	-2.747	260.997	13.050	9.343
	3830.0	17.54	*	9.447	11.293	20.856	82.294	10.647	166.520	1.060	0.983	42.742	-7.683	245.587	13.825	9.919
	3840.0	18.56	*	9.438	11.274	21.009	82.407	10.616	176.380	1.058	0.954	42.735	-12.501	232.261	15.113	10.956
	3850.0	19.57	*	9.427	11.255	21.221	82.623	10.575	186.240	1.055	0.915	42.724	-17.206	221.145	16.783	12.344
ECATE	TIME	CV	SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BFTA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	CV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMIN	VEL1	ALPHA1	PHI1	VINF1	DV1
3723	3800.0	26.56	9.423	11.170	22.050	83.189	10.427	97.799	1.043	2.215	42.688	29.458	-19.415	22.259	17.141
317	3810.0	24.18	9.419	11.162	21.719	82.857	10.451	107.659	1.048	2.119	42.694	23.812	-28.322	19.581	14.756
	3820.0	22.10	9.417	11.156	21.459	82.598	10.470	117.519	1.052	2.017	42.698	18.280	-38.814	17.188	12.687
	3830.0	20.44	9.414	11.150	21.271	82.408	10.482	127.379	1.055	1.911	42.702	12.866	-51.277	15.201	11.028
	3840.0	19.22	9.412	11.144	21.155	82.283	10.488	137.239	1.057	1.802	42.703	7.574	-65.862	13.764	9.871
	3850.0	18.70	9.408	11.135	21.110	82.219	10.485	147.099	1.057	1.689	42.702	2.403	-82.094	13.018	9.288
	3860.0	18.70	9.403	11.124	21.135	82.212	10.472	156.959	1.057	0.998	42.699	-2.646	-261.301	13.033	9.300
	3870.0	19.26	9.397	11.109	21.225	82.257	10.451	166.819	1.056	0.983	42.694	-7.576	-245.845	13.756	9.865
	3880.0	20.28	9.385	11.091	21.374	82.350	10.420	176.679	1.053	0.955	42.686	-12.390	-232.467	15.034	10.892
	3890.0	21.65	9.375	11.068	21.592	82.488	10.380	186.539	1.050	0.916	42.677	-17.093	-221.304	16.698	12.272
3773	3850.0	26.46	9.346	10.989	22.442	83.067	10.231	94.098	1.039	2.222	42.641	29.479	-19.304	22.234	17.119
267	3860.0	24.08	9.343	10.981	22.105	82.731	10.257	107.958	1.044	2.125	42.647	23.849	-28.174	19.560	14.738
	3870.0	22.01	9.340	10.975	21.841	82.468	10.276	117.818	1.048	2.024	42.651	18.332	-38.621	17.170	12.672
	3880.0	20.33	9.336	10.970	21.649	82.275	10.289	127.678	1.050	1.918	42.655	12.932	-51.034	15.180	11.011
	3890.0	19.16	9.335	10.963	21.530	82.148	10.295	137.538	1.052	1.808	42.656	7.651	-65.576	13.735	9.849
	3900.0	18.59	9.332	10.955	21.484	82.062	10.292	147.398	1.053	1.695	42.655	2.490	-81.789	12.978	9.257
	3910.0	18.59	9.327	10.944	21.507	82.074	10.281	157.258	1.053	0.998	42.653	-2.551	-261.590	12.980	9.258
	3920.0	19.13	9.321	10.930	21.597	82.119	10.260	167.118	1.051	0.983	42.648	-7.475	-246.091	13.690	9.813
	3930.0	20.14	9.314	10.912	21.752	82.212	10.230	176.978	1.049	0.956	42.640	-12.285	-232.663	14.959	10.831
	3940.0	21.51	9.304	10.890	21.965	82.351	10.190	186.838	1.046	0.917	42.631	-16.986	-221.454	16.617	12.204
3823	3900.0	26.37	9.272	10.814	22.835	82.745	10.042	98.397	1.036	2.229	42.596	29.496	-19.203	22.208	17.096
217	3910.0	23.97	9.265	10.805	22.495	82.603	10.066	108.257	1.040	2.132	42.601	23.883	-28.032	19.541	14.721
	3920.0	21.92	9.266	10.798	22.228	82.336	10.086	118.117	1.044	2.030	42.606	18.382	-38.435	17.152	12.656
	3930.0	20.26	9.264	10.794	22.030	82.140	10.101	127.977	1.046	1.924	42.610	12.993	-50.805	15.159	10.994
	3940.0	19.09	9.262	10.788	21.905	82.010	10.107	137.837	1.048	1.813	42.611	7.724	-65.306	13.708	9.827
	3950.0	18.47	9.258	10.780	21.860	81.943	10.105	147.697	1.049	1.700	42.610	2.573	-81.500	12.940	9.227
	3960.0	18.47	9.254	10.776	21.882	81.934	10.094	157.557	1.048	0.998	42.608	-2.461	-261.865	12.929	9.219
	3970.0	19.01	9.248	10.766	21.972	81.979	10.073	167.417	1.047	0.984	42.603	-7.379	-246.326	13.627	9.763
	3980.0	20.01	9.241	10.758	22.127	82.072	10.044	177.277	1.045	0.956	42.596	-12.186	-232.849	14.868	10.773
	3990.0	21.37	9.232	10.747	22.343	82.212	10.005	187.137	1.043	0.917	42.587	-16.885	-221.597	16.540	12.140
3873	3950.0	26.27	9.202	10.643	23.230	82.820	9.858	94.697	1.033	2.236	42.553	29.510	-19.110	22.183	17.072
167	3960.0	23.90	9.194	10.634	22.886	82.474	9.882	104.557	1.037	2.139	42.558	23.913	-27.904	19.520	14.703
	3970.0	21.64	9.195	10.628	22.614	82.202	9.902	114.417	1.040	2.037	42.563	18.425	-38.264	17.134	12.641
	3980.0	20.17	9.193	10.622	22.416	82.003	9.916	124.277	1.042	1.930	42.566	13.052	-50.585	15.140	10.978
	3990.0	19.00	9.191	10.616	22.242	81.870	9.922	134.137	1.044	1.819	42.568	7.794	-65.044	13.682	9.806
	4000.0	18.39	9.188	10.608	22.242	81.861	9.920	143.997	1.044	1.706	42.567	2.652	-81.215	12.903	9.199
	4010.0	18.36	9.184	10.599	22.260	81.792	9.911	153.857	1.044	0.998	42.565	-2.376	-262.126	12.880	9.181
	4020.0	18.09	9.178	10.586	22.350	81.837	9.891	163.717	1.043	0.984	42.560	-7.288	-246.549	13.567	9.716
	4030.0	19.09	9.172	10.569	22.506	81.931	9.862	173.577	1.041	0.957	42.554	-12.091	-233.025	14.820	10.717
	4040.0	21.24	9.163	10.549	22.724	82.071	9.824	183.437	1.039	0.918	42.545	-16.789	-221.731	16.467	12.078
3923	4000.0	26.13	9.134	10.477	23.628	82.694	9.678	94.396	1.030	2.242	42.511	29.520	-19.024	22.157	17.049
117	4010.0	23.62	9.130	10.468	23.279	82.343	9.703	104.256	1.033	2.145	42.517	23.939	-27.784	19.500	14.685
	4020.0	21.75	9.128	10.461	23.003	82.067	9.723	114.116	1.036	2.043	42.521	18.466	-38.105	17.116	12.626
	4030.0	20.09	9.125	10.456	22.802	81.864	9.737	123.976	1.038	1.936	42.525	13.104	-50.382	15.120	10.962
	4040.0	18.91	9.123	10.450	22.615	81.730	9.743	133.836	1.040	1.825	42.526	7.857	-64.804	13.656	9.786
	4050.0	18.29	9.120	10.442	22.623	81.659	9.742	143.696	1.040	1.711	42.526	2.725	-80.960	12.868	9.172
	4060.0	18.26	9.116	10.432	22.643	81.648	9.732	153.556	1.040	0.998	42.524	-2.294	-262.379	12.833	9.145
	4070.0	18.78	9.111	10.420	22.733	81.697	9.712	163.416	1.039	0.985	42.519	-7.201	-246.764	13.509	9.671
	4080.0	19.77	9.104	10.403	22.890	81.786	9.684	173.276	1.038	0.958	42.513	-12.000	-233.196	14.754	10.664
	4090.0	21.12	9.096	10.384	23.110	81.926	9.646	183.136	1.035	0.919	42.504	-16.696	-221.862	16.397	12.019
ECATE	TTIME	CV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMIN	VEL1	ALPHA1	PHI1	VINF1	DV1

DATE	TIME	DV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1	
3973 67	4000.0	25.03	*	9.069	10.316	24.028	*	82.566	9.502	99.295	1.027	2.249	42.472	29.528	-18.945	22.131	17.026
	4000.0	25.73	*	9.065	10.307	23.675	*	82.210	9.527	109.155	1.030	2.152	42.477	29.961	-17.673	19.479	14.667
	4000.0	21.67	*	9.062	10.300	23.395	*	81.930	9.547	110.015	1.033	2.049	42.482	18.502	-37.956	17.957	12.610
	4000.0	20.01	*	9.060	10.294	23.191	*	81.724	9.562	120.875	1.035	1.941	42.485	13.153	-50.192	15.101	10.946
	4000.0	16.82	*	9.058	10.288	23.061	*	81.587	9.569	130.735	1.036	1.830	42.487	7.917	-64.578	13.632	9.767
	4100.0	18.23	*	9.055	10.281	23.007	*	81.514	9.568	140.595	1.037	1.716	42.486	2.793	-80.716	12.834	9.146
	4100.0	18.16	*	9.051	10.271	23.027	*	81.502	9.558	150.455	1.036	0.997	42.484	-2.219	-202.612	12.768	9.111
	4100.0	18.67	*	9.046	10.259	23.117	*	81.546	9.539	160.315	1.036	0.985	42.480	-7.170	-246.963	13.455	9.628
	4100.0	19.65	*	9.040	10.243	23.274	*	81.641	9.511	170.175	1.034	0.958	42.474	-11.916	-233.353	14.693	10.614
	4100.0	21.00	*	9.032	10.224	23.496	*	81.784	9.474	180.035	1.032	0.920	42.465	-16.611	-221.981	16.330	11.963
4023 17	4100.0	25.01	*	9.007	10.159	24.431	*	82.435	9.330	99.594	1.024	2.256	42.434	29.533	-18.873	22.105	17.002
	4100.0	23.65	*	9.002	10.149	24.074	*	82.074	9.356	109.454	1.027	2.158	42.439	29.981	-27.570	19.458	14.648
	4100.0	21.59	*	9.000	10.142	23.790	*	81.791	9.376	119.314	1.029	2.055	42.444	18.535	-37.817	17.179	12.595
	4100.0	19.93	*	8.998	10.136	23.582	*	81.581	9.391	129.174	1.031	1.947	42.447	13.198	-50.014	15.082	10.930
	4100.0	18.74	*	8.995	10.130	23.450	*	81.442	9.398	139.034	1.032	1.836	42.448	7.972	-64.365	13.608	9.748
	4100.0	18.11	*	8.993	10.123	23.395	*	81.368	9.397	148.894	1.033	1.721	42.448	2.857	-80.486	12.802	9.121
	4100.0	18.07	*	8.985	10.114	23.413	*	81.355	9.388	158.754	1.033	0.999	42.446	-2.147	-262.833	12.746	9.078
	4100.0	18.57	*	8.984	10.102	23.503	*	81.398	9.369	168.614	1.032	0.985	42.442	-7.044	-244.151	13.403	9.588
	4100.0	19.54	*	8.978	10.087	23.661	*	81.494	9.342	178.474	1.031	0.959	42.436	-11.836	-233.501	14.634	10.567
	4100.0	20.88	*	8.971	10.069	23.884	*	81.638	9.305	188.334	1.029	0.920	42.428	-16.530	-222.053	16.267	11.911
4073 33	4100.0	25.92	*	8.946	10.006	24.837	*	82.303	9.163	99.893	1.021	2.262	42.397	29.534	-18.807	22.078	16.978
	4100.0	23.57	*	8.943	9.996	24.475	*	81.937	9.188	109.753	1.024	2.164	42.403	29.997	-27.475	19.437	14.630
	4100.0	21.52	*	8.941	9.989	24.188	*	81.650	9.209	119.613	1.026	2.061	42.407	18.565	-37.688	17.061	12.579
	4100.0	19.85	*	8.939	9.983	23.976	*	81.437	9.224	129.473	1.028	1.953	42.410	13.239	-47.849	15.063	10.915
	4100.0	18.65	*	8.935	9.977	23.842	*	81.295	9.232	139.333	1.029	1.841	42.412	8.023	-64.165	13.584	9.730
	4200.0	15.03	*	8.932	9.970	23.785	*	81.219	9.231	149.193	1.030	1.726	42.412	2.917	-80.269	12.770	9.097
	4200.0	17.94	*	8.925	9.961	23.802	*	81.205	9.222	159.053	1.029	0.999	42.410	-2.080	-263.040	12.705	9.047
	4200.0	18.47	*	8.924	9.949	23.892	*	81.248	9.204	168.913	1.029	0.985	42.406	-6.972	-247.328	13.354	9.549
	4200.0	19.44	*	8.914	9.935	24.051	*	81.345	9.177	178.773	1.027	0.959	42.400	-11.761	-233.640	14.578	10.522
	4200.0	20.77	*	8.910	9.917	24.276	*	81.491	9.141	188.633	1.026	0.921	42.392	-16.453	-222.197	16.207	11.861
4123 83	4200.0	25.84	*	8.880	9.856	25.246	*	82.168	8.999	100.192	1.019	2.269	42.362	29.534	-18.748	22.052	16.954
	4200.0	23.50	*	8.880	9.846	24.887	*	81.798	9.025	110.052	1.021	2.170	42.367	24.011	-27.387	19.416	14.611
	4200.0	21.45	*	8.882	9.839	24.588	*	81.506	9.046	119.912	1.023	2.067	42.372	18.591	-37.568	17.042	12.563
	4200.0	19.78	*	8.874	9.833	24.374	*	81.290	9.061	129.772	1.025	1.958	42.375	13.277	-47.693	15.044	10.900
	4200.0	18.53	*	8.877	9.827	24.237	*	81.146	9.069	139.632	1.026	1.846	42.377	8.071	-63.978	13.562	9.712
	4200.0	17.95	*	8.875	9.820	24.178	*	81.069	9.069	149.492	1.026	1.731	42.377	2.973	-80.066	12.741	9.074
	4200.0	17.69	*	8.871	9.812	24.194	*	81.054	9.060	159.352	1.026	0.999	42.375	-2.018	-263.235	12.667	9.017
	4200.0	18.34	*	8.867	9.800	24.284	*	81.097	9.042	169.212	1.025	0.986	42.371	-6.905	-247.494	13.307	9.512
	4200.0	19.34	*	8.862	9.786	24.445	*	81.194	9.016	179.072	1.024	0.959	42.365	-11.691	-233.770	14.525	10.479
	4200.0	20.67	*	8.856	9.770	24.672	*	81.341	8.980	188.932	1.023	0.921	42.358	-16.382	-222.295	16.150	11.813
DATE	TIME	DV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1	

TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

DATE	TIME	CV	SC	IV	VI	VF	PI	ALPHA	VEL	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
3857	3900.0	27.24	*	9.220	10.703	23.744	*	03.607	9.908	94.980	1.032	2.267	42.564	31.589	* -16.223	23.220	18.012
183	3900.0	26.71	*	9.222	10.702	22.676	*	02.634	9.933	104.840	1.036	2.173	42.570	25.947	* -24.552	20.478	15.548
	3900.0	26.50	*	9.215	10.565	22.572	*	02.337	9.955	114.700	1.040	2.073	42.575	20.414	* -34.303	17.977	13.362
	3900.0	26.76	*	9.217	10.673	22.354	*	02.112	9.971	124.560	1.043	1.967	42.579	14.994	* -45.875	15.823	11.541
	3970.0	19.34	*	9.214	10.673	22.704	*	01.757	9.980	134.420	1.045	1.858	42.581	9.690	* -59.575	14.152	10.180
	3970.0	19.57	*	9.212	10.668	22.125	*	01.867	9.983	144.280	1.046	1.746	42.582	4.500	* -75.239	13.113	9.361
	3990.0	18.34	*	9.203	10.552	22.12	*	01.855	9.975	154.140	1.046	1.000	42.580	-0.571	* 268.103	12.815	9.131
	4000.0	18.63	*	9.205	10.546	22.185	*	01.861	9.959	164.000	1.045	0.991	42.576	-5.527	* 251.984	13.258	9.474
	4010.0	19.52	*	9.197	10.631	22.317	*	01.937	9.935	173.860	1.043	0.968	42.570	-10.371	* 237.662	14.326	10.319
	4020.0	20.75	*	9.189	10.611	22.512	*	02.061	9.895	183.720	1.041	0.933	42.562	-15.107	* 225.583	15.850	11.563
3890	3971.6	25.59	*	9.177	10.563	23.264	*	02.677	9.892	101.422	1.033	2.213	42.540	28.016	* -21.285	21.445	16.409
150	3960.0	25.49	*	9.174	10.574	22.742	*	02.449	9.825	111.282	1.036	2.114	42.545	22.453	* -30.443	18.848	14.115
	3960.0	25.32	*	9.171	10.508	22.638	*	02.195	9.844	121.142	1.039	2.011	42.549	17.001	* -41.275	16.553	12.151
	4000.0	18.78	*	9.165	10.562	22.502	*	01.913	9.856	131.003	1.041	1.903	42.552	11.662	* -54.149	14.686	10.609
	4010.0	18.75	*	9.166	10.556	22.464	*	01.797	9.860	14.856	1.043	1.791	42.553	6.438	* -65.128	13.393	9.580
	4000.0	18.29	*	9.163	10.548	22.372	*	01.744	9.856	15.172	1.043	1.677	42.552	1.331	* -85.575	12.809	9.126
	4000.0	18.42	*	9.156	10.537	22.412	*	01.748	9.843	16.532	1.043	0.996	42.549	-3.662	* 277.913	12.980	9.258
	4000.0	19.08	*	9.153	10.573	22.502	*	01.806	9.821	17.443	1.041	0.978	42.544	-8.544	* 242.807	13.830	9.924
	4000.0	20.17	*	9.146	10.505	22.643	*	01.915	9.789	18.302	1.039	0.948	42.537	-13.317	* 225.870	15.202	11.029
	4000.0	21.60	*	9.137	10.464	22.927	*	02.065	9.749	19.162	1.037	0.906	42.528	-17.988	* 215.116	16.927	12.465
3940	4000.0	25.50	*	9.111	10.418	23.666	*	02.545	9.623	101.722	1.030	2.220	42.499	28.030	* -21.193	21.420	16.388
100	4000.0	25.20	*	9.107	10.410	23.335	*	02.215	9.647	111.582	1.033	2.121	42.504	22.482	* -30.316	18.828	14.098
	4000.0	21.26	*	9.104	10.403	23.076	*	01.903	9.666	121.442	1.036	2.017	42.509	17.043	* -41.108	16.535	12.135
	4000.0	19.69	*	9.102	10.396	22.805	*	01.773	9.678	131.302	1.038	1.909	42.511	11.716	* -52.940	14.665	10.592
	4000.0	18.66	*	9.095	10.391	22.788	*	01.655	9.683	141.162	1.039	1.797	42.512	6.503	* -68.886	13.366	9.558
	4000.0	18.13	*	9.096	10.383	22.754	*	01.600	9.677	151.022	1.039	1.682	42.512	1.404	* -85.321	12.771	9.098
	4000.0	18.90	*	9.095	10.373	22.703	*	01.604	9.667	16.836	1.039	0.996	42.509	-3.582	* 258.148	12.931	9.221
	4000.0	19.96	*	9.087	10.359	22.901	*	01.662	9.645	17.742	1.038	0.979	42.504	-8.459	* 243.002	13.772	9.878
	4100.0	20.44	*	9.08	10.343	23.175	*	01.769	9.614	18.602	1.036	0.949	42.497	-13.229	* 230.022	15.136	10.975
	4100.0	21.58	*	9.075	10.322	23.312	*	01.824	9.574	19.462	1.033	0.907	42.488	-17.898	* 219.231	16.857	12.407
3990	4000.0	25.41	*	9.046	10.258	24.066	*	02.410	9.449	10.8021	1.027	2.226	42.460	28.041	* -21.109	21.396	16.366
50	4000.0	25.12	*	9.044	10.249	23.731	*	02.061	9.473	11.881	1.030	2.127	42.465	22.507	* -30.159	18.808	14.081
	4000.0	21.14	*	9.04	10.243	23.47	*	01.820	9.492	121.741	1.032	2.023	42.469	17.082	* -40.952	16.517	12.120
	4100.0	19.61	*	9.032	10.237	23.234	*	01.631	9.509	131.601	1.034	1.914	42.472	11.767	* -53.744	14.445	10.576
	4100.0	18.97	*	9.034	10.231	23.174	*	01.511	9.519	141.461	1.035	1.802	42.473	6.564	* -68.657	13.340	9.538
	4100.0	18.1	*	9.032	10.223	23.134	*	01.450	9.505	151.321	1.035	1.687	42.473	1.473	* -85.082	12.735	9.070
	4100.0	18.21	*	9.022	10.213	23.177	*	01.450	9.494	161.181	1.035	0.996	42.470	-3.507	* 258.365	12.885	9.185
	4100.0	18.66	*	9.022	10.200	23.236	*	01.515	9.473	171.041	1.034	0.979	42.465	-8.378	* 243.186	13.717	9.834
	4100.0	19.44	*	9.017	10.134	23.361	*	01.624	9.443	18.091	1.032	0.949	42.458	-13.146	* 230.166	15.074	10.925
	4100.0	21.36	*	9.005	10.164	23.700	*	01.780	9.404	19.001	1.030	0.908	42.450	-17.814	* 219.335	16.752	12.351
4040	4100.0	25.53	*	8.984	10.107	24.460	*	02.205	9.279	102.321	1.024	2.233	42.422	28.048	* -21.031	21.371	16.344
	4100.0	25.04	*	8.981	10.093	24.135	*	01.944	9.303	112.181	1.027	2.133	42.428	22.529	* -30.090	18.788	14.063
	4100.0	21.06	*	8.977	10.087	23.865	*	01.673	9.323	122.041	1.029	2.029	42.432	17.117	* -40.807	16.459	12.105
	4100.0	19.56	*	8.97	10.081	23.676	*	01.487	9.337	131.901	1.030	1.920	42.435	11.813	* -53.560	14.625	10.560
	4100.0	18.41	*	8.974	10.075	23.563	*	01.405	9.341	141.761	1.031	1.807	42.436	6.620	* -68.442	13.314	9.518
	4100.0	18.01	*	8.971	10.067	23.527	*	01.307	9.338	151.621	1.032	1.692	42.435	1.538	* -84.856	12.701	9.044
	4100.0	18.12	*	8.967	10.058	23.555	*	01.305	9.326	161.481	1.031	0.996	42.433	-3.436	* 258.578	12.840	9.151
	4100.0	18.75	*	8.965	10.045	23.573	*	01.307	9.305	171.341	1.031	0.979	42.428	-8.303	* 243.360	13.664	9.792
	4200.0	18.65	*	8.957	10.022	23.639	*	01.476	9.275	181.201	1.029	0.950	42.421	-13.067	* 230.300	15.015	10.876
	4200.0	19.05	*	8.954	10.010	23.657	*	01.454	9.237	191.061	1.027	0.908	42.413	-17.735	* 219.440	16.729	12.298
DATE	TIME	CV	SC	IV	VI	VF	PI	ALPHA	VEL	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

FCATF	TIME	LV	SUM	LV2	VINF2	PHI2	ALPHA2	VEL2	BETA	FCCF	RMD	VEL1	ALPHA1	PHI1	VINF1	DV1
4090	4170.0	25.25	*	8.925	9.950	24.875	81.151	9.113	102.619	1.021	2.239	42.286	28.053	-20.961	21.346	16.322
317	4180.0	22.97	*	8.921	9.941	24.531	81.805	9.137	112.479	1.024	2.139	42.291	27.548	-29.989	18.768	14.046
	4190.0	21.01	*	8.915	9.935	24.262	81.536	9.157	122.339	1.026	2.035	42.296	17.148	-40.671	16.481	12.090
	4200.0	19.46	*	8.916	9.929	24.070	81.342	9.170	132.199	1.027	1.925	42.299	11.856	-53.381	14.606	10.544
	4210.0	18.41	*	8.914	9.923	23.956	81.217	9.176	142.059	1.028	1.812	42.300	6.673	-68.240	13.289	9.499
	4220.0	17.93	*	8.911	9.915	23.918	81.159	9.173	151.919	1.028	1.697	42.399	1.598	-84.644	12.668	9.018
	4230.0	17.03	*	8.908	9.906	23.955	81.159	9.161	161.779	1.028	0.997	42.397	-3.369	-258.775	12.798	9.118
	4240.0	16.66	*	8.903	9.894	24.003	81.217	9.141	171.639	1.027	0.980	42.392	-8.231	-243.523	13.613	9.752
	4250.0	16.73	*	8.897	9.879	24.241	81.327	9.112	181.499	1.026	0.950	42.386	-12.993	-230.427	14.959	10.831
	4260.0	21.14	*	8.890	9.861	24.484	81.486	9.074	191.359	1.024	0.909	42.378	-17.660	-219.534	16.669	12.248
4140	4270.0	25.17	*	8.882	9.852	25.283	81.714	8.950	102.918	1.019	2.245	42.352	28.055	-20.896	21.321	16.299
267	4280.0	22.89	*	8.864	9.793	24.935	81.663	8.975	112.778	1.021	2.145	42.357	22.564	-29.856	18.748	14.028
	4290.0	20.94	*	8.862	9.786	24.863	81.391	8.995	122.638	1.023	2.040	42.361	17.177	-40.545	16.463	12.074
	4300.0	19.37	*	8.859	9.780	24.668	81.193	9.008	132.496	1.024	1.931	42.364	11.895	-53.227	14.587	10.528
	4310.0	18.34	*	8.857	9.774	24.351	81.067	9.014	142.358	1.025	1.818	42.365	6.721	-68.051	13.765	9.480
	4320.0	17.85	*	8.854	9.767	24.312	81.036	9.012	152.218	1.025	1.702	42.365	1.655	-84.445	12.636	8.994
	4330.0	17.94	*	8.851	9.758	24.348	81.037	9.001	162.078	1.025	0.997	42.362	-3.306	-258.959	12.758	9.087
	4340.0	18.56	*	8.846	9.746	24.457	81.064	8.981	171.938	1.024	0.980	42.358	-8.164	-243.676	13.965	9.715
	4350.0	19.63	*	8.841	9.732	24.634	81.175	8.952	181.798	1.023	0.951	42.352	-12.924	-230.545	14.906	10.787
	4360.0	21.03	*	8.834	9.714	24.861	81.336	8.914	191.658	1.021	0.910	42.344	-17.590	-219.621	16.613	12.200
4190	4370.0	25.09	*	8.813	9.694	25.694	81.875	8.792	103.217	1.016	2.252	42.318	28.055	-20.838	21.256	16.276
217	4380.0	22.82	*	8.805	9.649	25.342	81.520	8.817	113.077	1.018	2.151	42.324	22.577	-29.811	18.727	14.010
	4390.0	20.87	*	8.807	9.642	25.066	81.244	8.837	122.937	1.020	2.046	42.328	17.202	-40.425	16.444	12.059
	4400.0	19.32	*	8.804	9.636	24.868	81.043	8.850	132.797	1.021	1.936	42.331	11.931	-53.078	14.567	10.513
	4410.0	18.26	*	8.802	9.630	24.749	80.714	8.856	142.657	1.022	1.822	42.332	6.766	-67.875	13.242	9.462
	4420.0	17.77	*	8.795	9.623	24.705	80.852	8.854	152.517	1.022	1.705	42.331	1.707	-84.255	12.606	8.971
	4430.0	17.85	*	8.796	9.614	24.744	80.852	8.844	162.377	1.022	0.997	42.329	-3.248	-255.132	12.719	9.058
	4440.0	18.47	*	8.792	9.603	24.853	80.910	8.824	172.237	1.021	0.980	42.325	-8.102	-243.819	13.520	9.679
	4450.0	19.53	*	8.787	9.589	25.033	81.022	8.796	182.097	1.020	0.951	42.319	-12.859	-230.654	14.855	10.746
	4460.0	20.94	*	8.780	9.572	25.280	81.184	8.759	191.957	1.018	0.910	42.311	-17.524	-219.702	16.559	12.155
4240	4470.0	25.01	*	8.760	9.514	26.108	81.734	8.636	103.517	1.014	2.258	42.286	28.052	-20.787	21.270	16.254
167	4480.0	22.75	*	8.756	9.508	25.751	81.374	8.662	113.377	1.015	2.157	42.292	22.587	-29.733	18.706	13.992
	4490.0	20.80	*	8.754	9.501	25.472	81.094	8.682	123.237	1.017	2.051	42.296	17.223	-40.322	16.426	12.044
	4500.0	19.25	*	8.751	9.495	25.271	80.891	8.696	133.096	1.018	1.941	42.298	11.963	-52.940	14.549	10.498
	4510.0	18.19	*	8.745	9.489	25.150	80.760	8.702	142.957	1.019	1.827	42.300	6.807	-67.710	13.219	9.444
	4520.0	17.70	*	8.747	9.482	25.108	80.696	8.700	152.817	1.019	1.711	42.299	1.756	-84.085	12.576	8.948
	4530.0	17.77	*	8.742	9.473	25.143	80.695	8.690	162.677	1.019	0.997	42.297	-3.193	-255.253	12.682	9.029
	4540.0	18.38	*	8.739	9.462	25.253	80.754	8.671	172.536	1.018	0.981	42.293	-8.043	-243.952	13.476	9.644
	4550.0	19.44	*	8.734	9.449	25.434	80.866	8.643	182.397	1.017	0.951	42.288	-12.798	-230.756	14.807	10.707
	4560.0	20.84	*	8.728	9.433	25.683	81.030	8.606	192.257	1.016	0.911	42.280	-17.462	-219.776	16.508	12.112
4290	4570.0	24.94	*	8.705	9.381	26.525	81.591	8.485	103.816	1.011	2.264	42.256	28.046	-20.741	21.244	16.230
117	4580.0	22.68	*	8.705	9.371	26.164	81.226	8.513	113.676	1.013	2.163	42.261	22.594	-29.663	18.665	13.974
	4590.0	20.73	*	8.703	9.363	25.881	80.942	8.531	123.536	1.014	2.057	42.265	17.242	-40.223	16.408	12.028
	4600.0	19.18	*	8.701	9.357	25.677	80.736	8.545	133.396	1.015	1.946	42.268	11.992	-52.812	14.530	10.483
	4610.0	18.12	*	8.699	9.351	25.554	80.603	8.551	143.256	1.016	1.832	42.269	6.845	-67.558	13.157	9.427
	4620.0	17.62	*	8.696	9.345	25.510	80.538	8.550	153.116	1.016	1.715	42.269	1.801	-83.924	12.548	8.927
	4630.0	17.70	*	8.693	9.336	25.545	80.537	8.540	162.976	1.016	0.997	42.267	-3.143	-259.443	12.647	9.002
	4640.0	18.30	*	8.689	9.326	25.655	80.595	8.521	172.836	1.015	0.981	42.263	-7.988	-244.076	13.435	9.612
	4650.0	19.35	*	8.684	9.313	25.838	80.709	8.493	182.696	1.014	0.952	42.257	-12.741	-230.850	14.761	10.669
	4660.0	20.75	*	8.678	9.297	26.089	80.874	8.457	192.556	1.013	0.911	42.250	-17.404	-219.844	16.460	12.072
FCATF	TIME	LV	SUM	LV2	VINF2	PHI2	ALPHA2	VEL2	BETA	FCCF	RMD	VEL1	ALPHA1	PHI1	VINF1	DV1



TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

DATE	TIME	CV	SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMD	VEL1	ALPHA1	PHI1	VINF1	DV1
4340	4420.0	24.67	*	8.660	9.247	26.944	81.446	8.336	104.115	1.009	2.270	42.226	28.038	-20.700	21.218	16.207
67	4430.0	22.61	*	8.655	9.237	26.579	81.376	8.362	113.975	1.011	2.168	42.231	22.598	-29.599	18.664	13.955
	4440.0	20.67	*	8.652	9.229	26.242	80.789	8.383	123.835	1.012	2.062	42.235	17.258	-40.133	16.369	12.012
	4450.0	19.12	*	8.651	9.223	26.046	80.579	8.397	133.695	1.012	1.951	42.238	12.018	-52.694	14.511	10.468
	4460.0	18.06	*	8.649	9.217	25.961	80.444	8.404	143.555	1.013	1.837	42.239	6.880	-67.418	13.175	9.410
	4470.0	17.55	*	8.647	9.211	25.916	80.377	8.403	153.415	1.013	1.720	42.239	1.842	-83.774	12.521	8.906
	4480.0	17.62	*	8.644	9.202	25.950	80.376	8.393	163.275	1.013	0.997	42.237	-3.096	-259.581	12.613	8.977
	4490.0	18.22	*	8.640	9.192	26.061	80.434	8.374	173.135	1.012	0.981	42.234	-7.938	-244.189	13.355	9.581
	4500.0	19.27	*	8.636	9.180	26.245	80.549	8.347	182.995	1.011	0.952	42.228	-12.687	-230.936	14.717	10.634
	4510.0	20.66	*	8.630	9.165	26.499	80.716	8.311	192.855	1.010	0.912	42.221	-17.351	-219.905	16.414	12.033
4390	4470.0	24.80	*	8.612	9.117	27.366	81.298	8.191	104.414	1.007	2.275	42.198	28.027	-20.665	21.152	16.183
17	4480.0	22.55	*	8.609	9.106	26.997	80.924	8.217	114.274	1.008	2.174	42.203	22.500	-29.542	18.642	13.936
	4490.0	20.60	*	8.606	9.099	26.707	80.632	8.238	124.134	1.009	2.067	42.207	17.271	-40.052	16.370	11.997
	4500.0	19.06	*	8.604	9.092	26.498	80.420	8.252	133.994	1.010	1.956	42.210	12.041	-52.586	14.452	10.453
	4510.0	18.00	*	8.602	9.086	26.370	80.282	8.259	143.854	1.010	1.841	42.211	6.911	-67.288	13.154	9.393
	4520.0	17.41	*	8.599	9.080	26.324	80.215	8.253	153.714	1.010	1.724	42.211	1.880	-83.636	12.495	8.886
	4530.0	17.55	*	8.597	9.072	26.358	80.212	8.244	163.574	1.010	0.997	42.209	-3.052	-259.709	13.351	8.952
	4540.0	18.14	*	8.592	9.062	26.469	80.271	8.231	173.434	1.010	0.981	42.205	-7.891	-244.294	13.358	9.552
	4550.0	19.19	*	8.589	9.050	26.655	80.387	8.204	183.294	1.009	0.952	42.200	-12.638	-231.014	14.676	10.601
	4560.0	20.58	*	8.584	9.036	26.911	80.556	8.168	193.154	1.008	0.912	42.193	-17.301	-219.961	16.370	11.997
4440	4520.0	24.74	*	8.567	8.990	27.790	81.149	8.049	104.713	1.005	2.281	42.170	28.014	-20.636	21.165	16.159
33	4530.0	22.46	*	8.562	8.979	27.417	80.769	8.072	114.573	1.006	2.177	42.175	22.599	-29.492	18.620	13.917
	4540.0	20.54	*	8.561	8.971	27.124	80.474	8.096	124.433	1.007	2.072	42.179	17.281	-39.978	16.351	11.981
	4550.0	19.00	*	8.558	8.965	26.912	80.252	8.111	134.293	1.007	1.961	42.182	12.060	-52.488	14.474	10.438
	4560.0	17.93	*	8.556	8.959	26.753	80.119	8.118	144.153	1.008	1.846	42.184	6.938	-67.170	13.133	9.377
	4570.0	17.42	*	8.554	8.952	26.746	80.059	8.117	154.013	1.008	1.728	42.183	1.915	-83.510	12.470	8.867
	4580.0	17.48	*	8.551	8.945	26.769	80.047	8.108	163.873	1.008	0.997	42.182	-3.013	-259.826	12.551	8.929
	4590.0	18.07	*	8.548	8.935	26.880	80.106	8.090	173.733	1.007	0.981	42.178	-7.847	-244.389	13.322	9.524
	4600.0	19.11	*	8.544	8.924	27.067	80.223	8.064	183.593	1.007	0.953	42.173	-12.593	-231.085	14.627	10.569
	4610.0	20.50	*	8.539	8.910	27.326	80.394	8.028	193.453	1.006	0.912	42.166	-17.255	-220.010	16.330	11.963
4490	4570.0	24.66	*	8.522	8.866	28.217	80.996	7.910	105.012	1.003	2.287	42.144	27.599	-20.612	21.138	16.135
83	4580.0	22.42	*	8.520	8.855	27.841	80.611	7.936	114.872	1.004	2.185	42.149	22.596	-29.448	18.598	13.898
	4590.0	20.43	*	8.517	8.847	27.544	80.312	7.957	124.732	1.004	2.077	42.153	17.288	-39.912	16.332	11.964
	4600.0	18.94	*	8.514	8.840	27.329	80.094	7.972	134.592	1.005	1.965	42.156	12.077	-52.399	14.455	10.423
	4610.0	17.87	*	8.512	8.834	27.192	79.952	7.980	144.452	1.005	1.850	42.157	6.963	-67.061	13.113	9.361
	4620.0	17.36	*	8.510	8.829	27.150	79.882	7.979	154.312	1.005	1.732	42.157	1.946	-83.394	12.445	8.849
	4630.0	17.41	*	8.507	8.820	27.183	79.877	7.970	164.172	1.005	0.997	42.155	-2.976	-259.933	12.521	8.906
	4640.0	18.00	*	8.505	8.813	27.291	79.940	7.954	174.032	1.005	0.982	42.152	-7.809	-244.470	13.289	9.498
	4650.0	19.04	*	8.501	8.801	27.443	80.057	7.926	183.892	1.004	0.953	42.147	-12.551	-231.147	14.600	10.539
	4660.0	20.43	*	8.497	8.787	27.745	80.230	7.892	193.752	1.003	0.913	42.141	-17.212	-220.054	16.291	11.930
DATE	TIME	CV	SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMD	VEL1	ALPHA1	PHI1	VINF1	DV1

ECATE	TTIME	CV	SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
4224	4300.0	25.93	*	8.777	9.564	26.122	* 81.933	8.676	99.800	1.014	2.291	42.295	30.085	* -17.848	22.274	17.154
183	4310.0	25.57	*	8.775	9.557	25.739	* 81.544	8.703	107.660	1.016	2.193	42.300	24.580	* -26.302	19.627	14.797
	4320.0	21.49	*	8.772	9.549	25.432	* 81.236	8.725	111.420	1.017	2.089	42.305	19.175	* -36.248	17.229	12.722
	4330.0	15.79	*	8.769	9.543	25.203	* 81.007	8.742	129.380	1.019	1.980	42.308	13.873	* -48.095	15.188	11.017
	4340.0	18.54	*	8.767	9.537	25.054	* 80.850	8.751	139.240	1.019	1.868	42.310	8.676	* -62.104	13.641	9.774
	4350.0	17.83	*	8.765	9.530	24.983	* 80.763	8.752	149.100	1.020	1.752	42.310	3.583	* -78.016	12.735	9.070
	4360.0	17.70	*	8.762	9.522	24.991	* 80.740	8.745	158.960	1.020	0.999	42.309	-1.405	* 265.264	12.569	8.943
	4370.0	18.13	*	8.758	9.512	25.073	* 80.777	8.729	168.820	1.019	0.988	42.305	-6.293	* 249.314	13.127	9.382
	4380.0	19.04	*	8.753	9.499	25.229	* 80.870	8.704	178.580	1.018	0.963	42.300	-11.083	* 235.296	14.282	10.273
	4390.0	20.37	*	8.747	9.484	25.453	* 81.015	8.670	188.540	1.017	0.927	42.293	-15.780	* 223.539	15.866	11.576
4258	4340.0	24.36	*	8.741	9.467	26.150	* 81.581	8.591	106.242	1.013	2.234	42.277	26.588	* -23.010	20.558	15.619
150	4350.0	22.17	*	8.738	9.458	25.812	* 81.241	8.615	116.102	1.015	2.131	42.282	21.155	* -32.343	18.061	13.434
	4360.0	20.32	*	8.735	9.451	25.552	* 80.980	8.633	125.962	1.016	2.024	42.286	15.822	* -43.428	15.875	11.584
	4370.0	18.89	*	8.733	9.445	25.371	* 80.795	8.645	135.822	1.017	1.913	42.288	10.593	* -56.617	14.128	10.161
	4380.0	17.98	*	8.731	9.439	25.271	* 80.682	8.650	145.682	1.018	1.798	42.289	5.468	* -71.896	12.969	9.249
	4390.0	17.63	*	8.728	9.432	25.240	* 80.635	8.646	155.542	1.018	1.681	42.288	0.446	* -88.492	12.521	8.906
	4400.0	17.86	*	8.725	9.423	25.304	* 80.651	8.633	165.402	1.017	0.994	42.286	-4.474	* 255.087	12.818	9.134
	4410.0	16.60	*	8.720	9.411	25.433	* 80.724	8.612	175.262	1.017	0.974	42.281	-9.297	* 240.260	13.770	9.876
	4420.0	17.75	*	8.715	9.397	25.634	* 80.851	8.582	185.122	1.016	0.942	42.275	-14.026	* 227.660	15.213	11.038
	4430.0	21.23	*	8.709	9.381	25.901	* 81.028	8.543	194.982	1.014	0.898	42.267	-18.668	* 217.212	16.988	12.517
4308	4340.0	24.29	*	8.691	9.331	26.566	* 81.435	8.440	108.542	1.011	2.239	42.247	26.585	* -22.960	20.533	15.597
100	4350.0	22.10	*	8.687	9.322	26.224	* 81.091	8.464	116.402	1.012	2.137	42.252	21.164	* -32.265	18.041	13.416
	4360.0	20.25	*	8.685	9.315	25.961	* 80.827	8.483	126.262	1.014	2.029	42.255	15.843	* -43.325	15.857	11.569
	4370.0	18.63	*	8.683	9.309	25.778	* 80.639	8.496	136.122	1.014	1.918	42.258	10.623	* -56.485	14.109	10.145
	4380.0	17.91	*	8.680	9.303	25.675	* 80.524	8.500	145.982	1.015	1.803	42.259	5.507	* -71.744	12.945	9.231
	4390.0	17.56	*	8.678	9.296	25.652	* 80.476	8.497	155.842	1.015	1.685	42.258	0.492	* -88.337	12.492	8.884
	4400.0	17.78	*	8.675	9.287	25.707	* 80.491	8.484	165.702	1.015	0.994	42.256	-4.424	* 255.227	12.782	9.106
	4410.0	19.51	*	8.670	9.276	25.837	* 80.565	8.463	175.562	1.014	0.974	42.251	-9.243	* 240.372	13.727	9.842
	4420.0	19.67	*	8.666	9.263	26.039	* 80.693	8.433	185.422	1.013	0.942	42.245	-13.970	* 227.744	15.167	11.000
	4430.0	21.14	*	8.660	9.247	26.399	* 80.873	8.395	195.282	1.012	0.899	42.238	-18.612	* 217.272	16.940	12.477
4358	4440.0	24.22	*	8.642	9.199	26.955	* 81.288	8.293	106.641	1.009	2.245	42.217	26.580	* -22.916	20.508	15.575
50	4450.0	22.04	*	8.639	9.189	26.630	* 80.939	8.317	116.701	1.010	2.142	42.222	21.170	* -32.201	18.020	13.399
	4460.0	20.19	*	8.636	9.182	26.374	* 80.671	8.336	126.561	1.011	2.035	42.226	15.860	* -43.231	15.839	11.554
	4470.0	18.76	*	8.634	9.176	26.187	* 80.481	8.349	136.421	1.012	1.923	42.229	10.651	* -56.364	14.050	10.130
	4480.0	17.65	*	8.632	9.170	26.042	* 80.364	8.354	146.281	1.012	1.807	42.230	5.542	* -71.603	12.922	9.214
	4490.0	17.49	*	8.629	9.163	26.058	* 80.315	8.350	156.141	1.012	1.690	42.229	0.534	* -88.192	12.463	8.862
	4500.0	17.71	*	8.626	9.154	26.113	* 80.329	8.338	166.001	1.012	0.994	42.226	-4.377	* 255.357	12.747	9.079
	4510.0	18.43	*	8.622	9.144	26.244	* 80.403	8.318	175.861	1.011	0.975	42.222	-9.193	* 240.475	13.687	9.811
	4520.0	19.58	*	8.618	9.131	26.448	* 80.533	8.288	185.721	1.010	0.942	42.217	-13.918	* 227.821	15.123	10.965
	4530.0	21.05	*	8.612	9.116	26.720	* 80.714	8.250	195.581	1.009	0.899	42.209	-18.559	* 217.326	16.855	12.438
4408	4490.0	24.15	*	8.596	9.069	27.407	* 81.138	8.149	107.140	1.007	2.251	42.189	26.571	* -22.878	20.483	15.553
0	4500.0	21.97	*	8.592	9.060	27.057	* 80.784	8.174	117.000	1.008	2.148	42.194	21.174	* -32.140	17.959	13.381
	4510.0	20.13	*	8.590	9.052	26.787	* 80.513	8.193	126.860	1.009	2.040	42.198	15.875	* -43.145	15.820	11.538
	4520.0	18.70	*	8.587	9.046	26.599	* 80.320	8.205	136.720	1.009	1.927	42.200	10.674	* -56.254	14.071	10.115
	4530.0	17.78	*	8.585	9.040	26.493	* 80.201	8.211	146.580	1.009	1.812	42.201	5.574	* -71.474	12.900	9.197
	4540.0	17.42	*	8.583	9.033	26.469	* 80.151	8.207	156.440	1.009	1.694	42.201	0.572	* -88.059	12.436	8.841
	4550.0	17.63	*	8.580	9.025	26.522	* 80.165	8.196	166.300	1.009	0.994	42.199	-4.334	* 255.475	12.714	9.054
	4560.0	18.36	*	8.576	9.015	26.654	* 80.240	8.175	176.160	1.009	0.975	42.195	-9.146	* 240.570	13.649	9.781
	4570.0	19.50	*	8.572	9.003	26.859	* 80.370	8.146	186.020	1.008	0.943	42.189	-13.870	* 227.890	15.082	10.931
	4580.0	20.97	*	8.567	8.988	27.134	* 80.554	8.109	195.880	1.007	0.900	42.182	-18.511	* 217.374	16.852	12.402
ECATE	TTIME	CV	SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATE	TIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMD	VEL1	ALPHA1	PHI1	VINF1	DV1
4458	4540.0	24.04	8.551	8.943	27.831	80.966	8.008	107.439	1.005	2.257	42.162	26.561	-22.845	20.458	15.530
317	4550.0	21.91	8.547	8.933	27.478	80.628	8.033	117.299	1.005	2.153	42.167	21.176	-32.086	17.978	13.362
	4560.0	20.07	8.545	8.926	27.205	80.353	8.052	127.159	1.006	2.045	42.171	15.886	-43.068	15.901	11.523
	4570.0	18.64	8.542	8.920	27.014	80.157	8.065	137.019	1.007	1.932	42.173	10.695	-56.153	14.052	10.100
	4580.0	17.72	8.540	8.914	26.906	80.036	8.070	146.879	1.007	1.816	42.174	5.602	-71.356	12.679	9.180
	4590.0	17.36	8.538	8.907	26.880	79.985	8.068	156.739	1.007	1.698	42.174	0.607	-87.938	12.409	8.821
	4600.0	17.56	8.535	8.899	26.934	79.999	8.056	166.599	1.007	0.994	42.172	-4.294	-255.584	12.693	9.030
	4610.0	18.28	8.532	8.899	27.066	80.074	8.036	176.459	1.006	0.975	42.168	-9.103	-240.655	13.613	9.752
	4620.0	19.43	8.527	8.877	27.274	80.206	8.007	186.319	1.005	0.943	42.162	-13.825	-227.952	15.743	10.899
	4630.0	20.89	8.523	8.863	27.552	80.392	7.970	196.179	1.005	0.900	42.155	-18.466	-217.416	16.711	12.368
4508	4590.0	24.01	8.508	8.821	28.256	80.832	7.870	107.738	1.003	2.262	42.137	26.548	-22.819	20.432	15.507
267	4600.0	21.85	8.504	8.810	27.901	80.468	7.895	117.598	1.003	2.158	42.141	21.174	-32.035	17.957	13.344
	4610.0	20.01	8.501	8.803	27.624	80.190	7.915	127.458	1.004	2.049	42.145	15.895	-43.000	15.782	11.507
	4620.0	18.58	8.495	8.796	27.432	79.992	7.928	137.318	1.004	1.936	42.147	10.713	-56.061	14.033	10.085
	4630.0	17.66	8.497	8.790	27.322	79.868	7.933	147.178	1.004	1.820	42.148	5.628	-71.247	12.458	9.164
	4640.0	17.30	8.495	8.783	27.295	79.816	7.930	157.038	1.004	1.701	42.148	0.638	-87.827	12.364	8.802
	4650.0	17.50	8.492	8.776	27.349	79.830	7.919	166.898	1.004	0.994	42.146	-4.258	-255.681	12.652	9.006
	4660.0	18.21	8.489	8.766	27.483	79.905	7.899	176.758	1.004	0.975	42.142	-9.063	-240.732	13.679	9.725
	4670.0	19.35	8.485	8.755	27.632	80.039	7.871	186.618	1.003	0.943	42.137	-13.784	-228.008	15.706	10.869
	4680.0	20.62	8.480	8.742	27.973	80.227	7.834	196.478	1.002	0.900	42.130	-18.425	-217.454	16.773	12.336
4558	4640.0	23.95	8.466	8.702	28.682	80.676	7.736	108.037	1.001	2.267	42.112	26.531	-22.799	20.405	15.483
217	4650.0	21.79	8.462	8.689	28.332	80.305	7.759	117.897	1.001	2.163	42.116	21.172	-31.995	17.935	13.326
	4660.0	19.95	8.459	8.682	28.046	80.025	7.780	127.757	1.002	2.054	42.120	15.901	-42.935	15.763	11.491
	4670.0	18.53	8.457	8.676	27.851	79.824	7.794	137.617	1.002	1.941	42.122	10.728	-55.981	14.015	10.070
	4680.0	17.60	8.455	8.669	27.742	79.698	7.798	147.477	1.002	1.824	42.123	5.651	-71.150	12.837	9.148
	4690.0	17.24	8.453	8.663	27.714	79.645	7.796	157.337	1.002	1.705	42.123	0.667	-87.725	12.360	8.784
	4700.0	17.44	8.450	8.655	27.768	79.659	7.785	167.197	1.002	0.995	42.121	-4.224	-255.771	12.623	8.984
	4710.0	18.15	8.447	8.646	27.903	79.734	7.765	177.057	1.001	0.975	42.117	-9.027	-240.803	13.546	9.700
	4720.0	19.28	8.443	8.635	28.113	79.870	7.737	186.917	1.001	0.944	42.112	-13.746	-228.056	14.971	10.840
	4730.0	20.75	8.439	8.624	28.391	80.062	7.703	196.777	1.000	0.900	42.106	-18.389	-217.481	16.739	12.307
4608	4690.0	23.89	8.426	8.544	27.116	80.515	7.604	108.337	0.999	2.273	42.088	26.515	-22.780	20.379	15.460
167	4700.0	21.73	8.422	8.534	26.749	80.145	7.630	118.197	0.999	2.168	42.092	21.162	-31.969	17.912	13.306
	4710.0	19.84	8.420	8.528	26.461	79.862	7.652	128.057	1.000	2.059	42.096	15.900	-42.896	15.743	11.474
	4720.0	18.48	8.426	8.524	26.178	79.691	7.691	137.917	1.000	1.943	42.103	10.702	-55.020	13.950	10.050
	4730.0	17.55	8.416	8.506	25.146	79.533	7.672	147.777	1.000	1.828	42.100	5.663	-71.086	12.816	9.132
	4740.0	17.18	8.415	8.504	25.103	79.465	7.674	157.637	1.000	1.708	42.100	0.680	-87.681	12.337	8.767
	4750.0	17.37	8.411	8.500	25.181	79.488	7.656	167.497	1.000	0.995	42.097	-4.198	-255.840	12.597	8.964
	4760.0	18.09	8.408	8.533	25.313	79.567	7.638	177.357	0.999	0.976	42.094	-9.099	-240.850	13.518	9.677
	4770.0	19.22	8.404	8.520	25.534	79.699	7.607	187.217	0.999	0.944	42.088	-13.713	-228.096	14.939	10.814
	4780.0	20.68	8.400	8.508	25.820	79.892	7.571	197.077	0.998	0.901	42.082	-18.354	-217.505	16.704	12.278
4658	4740.0	23.82	8.387	8.469	29.555	80.352	7.473	104.636	0.997	2.278	42.064	26.497	-22.766	20.352	15.437
117	4750.0	21.67	8.383	8.458	29.187	79.976	7.499	114.496	0.997	2.173	42.069	21.156	-31.935	17.850	13.287
	4760.0	19.84	8.380	8.450	28.902	79.686	7.519	124.356	0.997	2.064	42.072	15.906	-42.837	15.724	11.459
	4770.0	18.42	8.378	8.443	28.701	79.480	7.533	134.216	0.998	1.949	42.075	10.749	-55.844	13.977	10.040
	4780.0	17.49	8.376	8.437	28.587	79.352	7.538	144.076	0.998	1.832	42.076	5.686	-70.988	12.797	9.117
	4790.0	17.12	8.374	8.431	28.557	79.296	7.536	153.936	0.998	1.712	42.075	0.714	-87.559	12.313	8.749
	4800.0	17.31	8.371	8.424	28.611	79.310	7.526	163.796	0.997	0.995	42.074	-4.169	-255.917	12.570	8.944
	4810.0	18.02	8.369	8.416	28.747	79.387	7.507	173.656	0.997	0.976	42.070	-9.066	-240.913	13.487	9.653
	4820.0	19.15	8.365	8.406	28.962	79.525	7.479	183.516	0.997	0.944	42.065	-13.682	-228.132	14.908	10.789
	4830.0	20.61	8.361	8.394	29.251	79.720	7.443	193.376	0.996	0.901	42.059	-18.322	-217.530	16.672	12.251
ECATE	TIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMD	VEL1	ALPHA1	PHI1	VINF1	DV1

FCATE	TTIME	DV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1	
4708 67	4750.0	23.76	*	8.345	8.358	29.993	*	80.167	7.346	108.935	0.995	2.283	42.C42	26.475	-22.758	20.325	15.412
	4800.0	21.61	*	8.345	8.346	29.622	*	79.806	7.372	114.795	0.995	2.178	42.C46	21.145	-31.912	17.868	13.268
	4810.0	19.79	*	8.343	8.338	29.333	*	79.513	7.392	124.655	0.995	2.068	42.C50	15.905	-42.798	15.705	11.443
	4820.0	18.57	*	8.340	8.331	29.131	*	79.304	7.406	134.515	0.996	1.954	42.C52	10.756	-55.788	13.959	10.026
	4830.0	17.44	*	8.338	8.325	29.014	*	79.174	7.412	144.375	0.995	1.836	42.C53	5.700	-70.921	12.777	9.102
	4840.0	17.07	*	8.336	8.319	28.984	*	79.118	7.410	154.235	0.995	1.716	42.C53	0.733	-87.490	12.251	8.732
	4850.0	17.26	*	8.334	8.312	29.039	*	79.131	7.400	164.095	0.995	0.995	42.C51	-4.145	255.979	12.545	8.924
	4860.0	17.96	*	8.231	8.304	29.176	*	79.209	7.381	177.955	0.995	0.976	42.C48	-8.939	240.955	13.459	9.631
	4870.0	19.09	*	8.328	8.295	29.392	*	79.348	7.354	187.815	0.995	0.944	42.C43	-13.654	228.161	14.879	10.765
	4880.0	20.55	*	8.325	8.284	29.683	*	79.546	7.318	197.675	0.994	0.901	42.C37	-18.295	217.545	16.643	12.226
4758 17	4840.0	23.70	*	8.312	8.249	30.434	*	80.019	7.222	104.234	0.994	2.288	42.C20	26.452	-22.755	20.298	15.388
	4850.0	21.56	*	8.305	8.237	30.059	*	79.634	7.245	114.094	0.994	2.183	42.C25	21.132	-31.895	17.845	13.248
	4860.0	19.73	*	8.306	8.228	29.768	*	79.338	7.268	124.754	0.994	2.072	42.C28	15.901	-42.766	15.685	11.426
	4870.0	18.31	*	8.304	8.221	29.563	*	79.126	7.282	134.814	0.994	1.958	42.C31	10.761	-55.741	13.940	10.011
	4880.0	17.39	*	8.302	8.215	29.445	*	78.994	7.288	144.674	0.993	1.840	42.C32	5.711	-70.863	12.758	9.087
	4890.0	17.02	*	8.300	8.209	29.414	*	78.937	7.287	154.534	0.993	1.719	42.C31	0.750	-87.430	12.270	8.716
	4900.0	17.20	*	8.298	8.203	29.469	*	78.950	7.276	164.394	0.993	0.995	42.C30	-4.124	256.029	12.521	8.906
	4910.0	17.91	*	8.295	8.195	29.607	*	79.029	7.258	174.254	0.993	0.976	42.C26	-8.916	240.996	13.433	9.611
	4920.0	19.04	*	8.292	8.186	29.824	*	79.170	7.231	184.114	0.993	0.944	42.C22	-13.629	228.183	14.851	10.743
	4930.0	20.49	*	8.289	8.176	30.119	*	79.370	7.196	197.974	0.993	0.901	42.C16	-18.270	217.556	16.615	12.203
4808 23	4840.0	23.64	*	8.278	8.143	30.677	*	79.849	7.100	104.533	0.992	2.293	41.999	26.427	-22.756	20.270	15.363
	4900.0	21.50	*	8.274	8.131	30.499	*	79.459	7.126	114.393	0.992	2.188	42.C04	21.117	-31.884	17.821	13.228
	4910.0	19.68	*	8.271	8.122	30.205	*	79.159	7.146	124.253	0.992	2.077	42.C07	15.895	-42.741	15.665	11.409
	4920.0	18.27	*	8.265	8.115	29.997	*	78.945	7.160	134.113	0.992	1.962	42.C10	10.762	-55.702	13.921	9.996
	4930.0	17.34	*	8.267	8.108	29.878	*	78.811	7.167	144.973	0.992	1.843	42.C11	5.719	-70.815	12.739	9.073
	4940.0	16.97	*	8.265	8.103	29.847	*	78.753	7.165	154.833	0.991	1.722	42.C11	0.764	-87.380	12.250	8.701
	4950.0	17.15	*	8.263	8.096	29.902	*	78.766	7.155	164.693	0.991	0.995	42.C09	-4.107	256.072	12.498	8.889
	4960.0	17.85	*	8.261	8.089	30.040	*	78.845	7.137	174.553	0.991	0.976	42.C06	-8.896	241.025	13.409	9.592
	4970.0	18.98	*	8.258	8.080	30.260	*	78.988	7.110	184.413	0.991	0.944	42.C01	-13.608	228.200	14.826	10.722
	4980.0	20.44	*	8.255	8.071	30.558	*	79.191	7.075	198.273	0.991	0.901	41.995	-18.249	217.561	16.550	12.181
4858 83	4940.0	23.58	*	8.245	8.039	31.322	*	79.676	6.980	104.832	0.991	2.298	41.979	26.399	-22.762	20.242	15.338
	4950.0	21.45	*	8.241	8.026	30.941	*	79.281	7.007	114.692	0.990	2.192	41.984	21.099	-31.877	17.758	13.208
	4960.0	19.63	*	8.238	8.017	30.644	*	78.978	7.027	124.552	0.990	2.081	41.987	15.886	-42.722	15.644	11.393
	4970.0	18.22	*	8.235	8.010	30.435	*	78.761	7.041	134.412	0.990	1.966	41.990	10.762	-55.671	13.903	9.981
	4980.0	17.29	*	8.233	8.004	30.314	*	78.625	7.048	144.272	0.990	1.847	41.991	5.725	-70.775	12.721	9.059
	4990.0	16.92	*	8.232	7.998	30.282	*	78.566	7.047	154.132	0.989	1.726	41.991	0.775	-87.340	12.230	8.686
	5000.0	17.10	*	8.230	7.992	30.337	*	78.579	7.037	164.992	0.989	0.995	41.989	-4.092	256.105	12.477	8.873
	5010.0	17.80	*	8.227	7.985	30.477	*	78.660	7.019	174.852	0.989	0.976	41.986	-8.878	241.047	13.386	9.574
	5020.0	18.93	*	8.225	7.977	30.699	*	78.804	6.992	184.712	0.989	0.944	41.981	-13.589	228.210	14.802	10.703
	5030.0	20.38	*	8.222	7.968	30.999	*	79.009	6.957	194.572	0.989	0.902	41.976	-18.231	217.561	16.566	12.161
FCATE	TTIME	DV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1	

TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	CV	SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCF	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
4591	4670.0	24.76	*	8.440	8.627	29.126	80.726	7.636	104.620	0.999	2.308	42.093	28.509	-19.764	21.349	16.324
183	4680.0	22.51	*	8.438	8.620	28.716	80.330	7.669	114.480	1.000	2.205	42.099	23.113	-28.439	18.754	14.068
	4700.0	18.96	*	8.430	8.596	28.208	79.771	7.697	134.200	1.000	1.986	42.105	12.626	-50.880	14.586	10.528
	4710.0	17.84	*	8.428	8.590	28.064	79.617	7.706	144.060	1.000	1.870	42.106	7.518	-65.294	13.181	9.414
	4720.0	17.26	*	8.425	8.581	28.014	79.534	7.704	153.920	1.000	1.752	42.106	2.508	-81.476	12.433	8.839
	4730.0	17.26	*	8.424	8.579	28.022	79.530	7.702	163.780	1.000	0.998	42.105	-2.420	-261.773	12.426	8.834
	4750.0	18.78	*	8.420	8.567	28.287	79.708	7.668	183.500	1.000	0.957	42.099	-12.011	-232.477	14.363	10.365
	4750.0	20.13	*	8.414	8.551	28.563	79.872	7.629	193.360	0.999	0.918	42.092	-16.672	-221.150	16.037	11.718
4625	4710.0	23.26	*	8.411	8.541	29.164	80.351	7.565	111.062	0.998	2.247	42.081	25.078	-25.070	19.651	14.853
150	4720.0	21.19	*	8.407	8.530	28.821	80.001	7.589	120.922	0.999	2.141	42.085	19.754	-34.669	17.295	12.778
	4730.0	19.45	*	8.405	8.523	28.559	79.737	7.608	130.782	0.999	2.031	42.088	14.523	-46.115	15.225	11.048
	4740.0	18.16	*	8.403	8.516	28.333	79.553	7.619	140.642	0.999	1.916	42.090	9.386	-59.720	13.614	9.753
	4750.0	17.37	*	8.401	8.511	28.289	79.447	7.624	150.502	0.999	1.798	42.091	4.342	-75.362	12.610	8.974
	4760.0	17.16	*	8.398	8.504	28.287	79.409	7.618	160.362	0.999	1.000	42.090	-0.608	-267.924	12.326	8.758
	4770.0	17.49	*	8.396	8.497	28.367	79.440	7.606	170.222	0.999	0.991	42.088	-5.471	-251.689	12.773	9.099
	4780.0	18.33	*	8.393	8.488	28.517	79.533	7.584	180.082	0.998	0.968	42.084	-10.248	-237.257	13.842	9.933
	4790.0	19.56	*	8.385	8.477	28.751	79.685	7.554	189.942	0.998	0.933	42.079	-14.943	-225.092	15.370	11.166
	4800.0	21.09	*	8.385	8.464	29.058	79.893	7.516	199.802	0.998	0.888	42.072	-19.564	-215.021	17.203	12.700
4675	4760.0	23.20	*	8.372	8.427	29.601	80.186	7.436	111.362	0.997	2.253	42.058	25.061	-25.054	19.666	14.830
100	4770.0	21.13	*	8.365	8.417	29.253	79.837	7.460	121.222	0.997	2.146	42.062	19.748	-34.638	17.274	12.760
	4780.0	19.40	*	8.366	8.409	28.949	79.564	7.479	131.082	0.997	2.035	42.065	14.526	-46.064	15.266	11.032
	4790.0	18.10	*	8.364	8.402	28.811	79.378	7.491	140.942	0.997	1.920	42.067	9.397	-59.654	13.595	9.738
	4800.0	17.37	*	8.362	8.396	28.718	79.269	7.495	150.802	0.997	1.802	42.068	4.361	-75.282	12.589	8.958
	4810.0	17.10	*	8.360	8.390	28.711	79.232	7.490	160.662	0.997	1.000	42.067	-0.585	-267.998	12.302	8.740
	4820.0	17.44	*	8.350	8.383	28.788	79.263	7.478	170.522	0.997	0.991	42.065	-5.444	-251.754	12.746	9.078
	4830.0	18.26	*	8.355	8.374	28.945	79.357	7.456	180.382	0.996	0.968	42.061	-10.218	-237.304	13.813	9.910
	4840.0	19.49	*	8.351	8.364	29.187	79.511	7.427	190.242	0.996	0.934	42.056	-14.913	-225.122	15.339	11.141
	4850.0	21.02	*	8.347	8.352	29.489	79.721	7.389	200.102	0.996	0.888	42.049	-19.535	-215.037	17.112	12.674
4725	4810.0	23.14	*	8.335	8.316	30.039	80.018	7.310	111.661	0.995	2.258	42.035	25.042	-25.045	19.640	14.808
50	4820.0	21.07	*	8.332	8.306	29.688	79.660	7.334	121.521	0.995	2.151	42.040	19.739	-34.613	17.252	12.741
	4830.0	19.35	*	8.329	8.298	29.421	79.389	7.353	131.381	0.995	2.039	42.043	14.526	-46.023	15.187	11.017
	4840.0	18.05	*	8.327	8.291	29.241	79.200	7.365	141.241	0.995	1.924	42.045	9.405	-59.597	13.577	9.724
	4850.0	17.27	*	8.325	8.285	29.147	79.090	7.369	151.101	0.995	1.805	42.046	4.375	-75.216	12.569	8.943
	4860.0	17.05	*	8.323	8.279	29.139	79.052	7.365	160.961	0.995	1.000	42.045	-0.566	-268.062	12.280	8.724
	4870.0	17.36	*	8.321	8.272	29.216	79.083	7.353	170.821	0.995	0.991	42.043	-5.420	-251.808	12.721	9.059
	4880.0	18.21	*	8.318	8.264	29.375	79.178	7.332	180.681	0.994	0.969	42.039	-10.192	-237.342	13.785	9.888
	4890.0	19.43	*	8.315	8.254	29.612	79.334	7.302	190.541	0.994	0.934	42.034	-14.886	-225.145	15.310	11.118
	4900.0	20.96	*	8.311	8.243	29.924	79.547	7.265	200.401	0.994	0.888	42.028	-19.509	-215.047	17.144	12.649
4775	4840.0	23.08	*	8.300	8.208	30.479	79.849	7.186	111.960	0.993	2.263	42.014	25.021	-25.040	19.613	14.784
0	4850.0	21.07	*	8.296	8.197	30.125	79.486	7.211	121.820	0.993	2.156	42.018	19.728	-34.594	17.230	12.722
	4860.0	19.34	*	8.292	8.189	29.856	79.211	7.230	131.680	0.993	2.044	42.022	14.524	-45.985	15.168	11.001
	4870.0	18.00	*	8.291	8.182	29.673	79.021	7.242	141.540	0.993	1.928	42.024	9.410	-59.550	13.558	9.709
	4880.0	17.22	*	8.289	8.176	29.578	78.908	7.246	151.400	0.993	1.809	42.024	4.387	-75.160	12.550	8.928
	4890.0	16.99	*	8.287	8.170	29.570	78.870	7.242	161.260	0.993	1.000	42.024	-0.549	-266.117	12.258	8.707
	4900.0	17.33	*	8.285	8.164	29.647	78.901	7.230	171.120	0.993	0.991	42.022	-5.400	-251.853	12.697	9.040
	4910.0	18.15	*	8.283	8.156	29.877	78.997	7.209	180.980	0.992	0.969	42.018	-10.169	-237.372	13.759	9.867
	4920.0	19.38	*	8.280	8.147	30.047	79.155	7.180	190.840	0.992	0.934	42.013	-14.863	-225.161	15.263	11.096
	4930.0	20.90	*	8.276	8.136	30.362	79.371	7.143	200.700	0.992	0.888	42.007	-19.486	-215.053	17.117	12.626
ECATE	TTIME	CV	SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCF	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

ECATE	TTIME	CV	SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1		
4825 317	4910.0	23.03	•	8.265	8.103	30.922	•	79.676	7.065	112.259	0.992	2.267	41.994	24.998	•	-25.035	19.587	14.761
	4920.0	20.96	•	8.262	8.092	30.565	•	79.309	7.090	122.119	0.991	2.160	41.998	19.714	•	-34.581	17.207	12.703
	4930.0	19.24	•	8.255	8.083	30.293	•	79.031	7.109	131.979	0.991	2.048	42.001	14.519	•	-45.962	15.148	10.985
	4940.0	17.95	•	8.257	8.076	30.108	•	78.838	7.121	141.839	0.991	1.932	42.003	9.413	•	-59.511	13.540	9.694
	4950.0	17.17	•	8.255	8.070	30.012	•	78.724	7.126	151.699	0.991	1.813	42.004	4.396	•	-75.113	12.531	8.914
	4960.0	16.94	•	8.252	8.064	30.004	•	78.685	7.122	161.559	0.991	1.000	42.003	-0.535	•	268.162	12.238	8.692
	4970.0	17.27	•	8.251	8.058	30.081	•	78.716	7.110	171.419	0.991	0.991	42.001	-5.382	•	251.889	12.674	9.023
	4980.0	18.19	•	8.248	8.050	30.242	•	78.813	7.089	181.279	0.990	0.965	41.998	-10.150	•	237.396	13.735	9.848
	4990.0	19.32	•	8.246	8.042	30.484	•	78.973	7.060	191.139	0.990	0.934	41.993	-14.842	•	225.173	15.258	11.075
	5000.0	20.85	•	8.242	8.032	30.802	•	79.192	7.024	200.999	0.990	0.888	41.987	-19.465	•	215.054	17.092	12.605
4875 267	4960.0	22.97	•	8.232	8.000	31.368	•	79.501	6.947	112.558	0.990	2.272	41.974	24.973	•	-25.043	19.560	14.737
	4970.0	20.91	•	8.228	7.988	31.008	•	79.129	6.972	122.418	0.990	2.165	41.978	19.699	•	-34.573	17.184	12.684
	4980.0	19.19	•	8.226	7.980	30.733	•	78.848	6.991	132.278	0.989	2.052	41.981	14.512	•	-45.943	15.128	10.968
	4990.0	17.90	•	8.223	7.973	30.546	•	78.652	7.003	142.138	0.989	1.936	41.983	9.413	•	-59.480	13.521	9.680
	5000.0	17.12	•	8.221	7.967	30.449	•	78.537	7.008	151.998	0.989	1.816	41.984	4.402	•	-75.076	12.512	8.899
	5010.0	16.90	•	8.220	7.961	30.440	•	78.498	7.004	161.858	0.989	1.000	41.983	-0.524	•	268.159	12.218	8.676
	5020.0	17.22	•	8.218	7.955	30.518	•	78.529	6.992	171.718	0.989	0.991	41.981	-5.368	•	251.917	12.652	9.006
	5030.0	18.05	•	8.215	7.947	30.681	•	78.627	6.972	181.578	0.989	0.969	41.978	-10.133	•	237.412	13.712	9.830
	5040.0	19.27	•	8.213	7.939	30.925	•	78.789	6.943	191.438	0.989	0.934	41.973	-14.824	•	225.178	15.235	11.056
	5050.0	20.80	•	8.210	7.930	31.246	•	79.011	6.906	201.298	0.989	0.889	41.967	-19.448	•	215.051	17.069	12.586
4925 217	5010.0	22.91	•	8.200	7.899	31.816	•	79.322	6.831	112.857	0.989	2.277	41.955	24.945	•	-25.052	19.532	14.713
	5020.0	20.86	•	8.196	7.887	31.453	•	78.947	6.856	122.717	0.988	2.169	41.959	19.681	•	-34.571	17.161	12.664
	5030.0	19.15	•	8.193	7.879	31.176	•	78.662	6.875	132.577	0.988	2.056	41.962	14.503	•	-45.925	15.108	10.952
	5040.0	17.86	•	8.191	7.872	30.987	•	78.464	6.887	142.437	0.987	1.939	41.964	9.411	•	-59.457	13.503	9.665
	5050.0	17.07	•	8.189	7.866	30.889	•	78.348	6.892	152.297	0.987	1.819	41.965	4.406	•	-75.048	12.494	8.886
	5060.0	16.85	•	8.187	7.860	30.879	•	78.307	6.889	162.157	0.987	1.000	41.964	-0.516	•	268.226	12.198	8.662
	5070.0	17.18	•	8.186	7.854	30.958	•	78.339	6.877	172.017	0.987	0.991	41.962	-5.356	•	251.936	12.632	8.991
	5080.0	18.00	•	8.183	7.847	31.122	•	78.438	6.857	181.877	0.987	0.969	41.959	-10.119	•	237.421	13.690	9.813
	5090.0	19.22	•	8.181	7.839	31.368	•	78.602	6.828	191.737	0.987	0.934	41.954	-14.810	•	225.178	15.213	11.038
	5100.0	20.75	•	8.178	7.831	31.693	•	78.827	6.792	201.597	0.987	0.889	41.948	-19.434	•	215.042	17.047	12.568
4975 167	5050.0	22.86	•	8.165	7.801	32.267	•	79.141	6.717	113.156	0.987	2.282	41.936	24.916	•	-25.065	19.504	14.689
	5070.0	20.81	•	8.165	7.789	31.901	•	78.761	6.742	123.017	0.986	2.173	41.940	19.661	•	-34.574	17.138	12.644
	5080.0	19.10	•	8.162	7.780	31.621	•	78.473	6.761	132.877	0.986	2.060	41.944	14.491	•	-45.923	15.088	10.935
	5090.0	17.81	•	8.160	7.773	31.431	•	78.273	6.774	142.737	0.986	1.943	41.946	9.407	•	-59.442	13.484	9.651
	5100.0	17.03	•	8.158	7.767	31.331	•	78.155	6.779	152.596	0.985	1.823	41.946	4.407	•	-75.028	12.476	8.872
	5110.0	16.80	•	8.156	7.761	31.322	•	78.114	6.775	162.457	0.985	1.000	41.946	-0.510	•	268.244	12.180	8.648
	5120.0	17.13	•	8.155	7.755	31.401	•	78.146	6.764	172.317	0.985	0.991	41.944	-5.347	•	251.948	12.612	8.976
	5130.0	17.95	•	8.153	7.749	31.566	•	78.246	6.744	182.177	0.985	0.969	41.941	-10.108	•	237.424	13.670	9.797
	5140.0	19.17	•	8.150	7.741	31.815	•	78.412	6.715	192.036	0.985	0.934	41.936	-14.798	•	225.172	15.193	11.021
	5150.0	20.70	•	8.148	7.733	32.142	•	78.640	6.679	201.897	0.986	0.889	41.930	-19.423	•	215.030	17.028	12.551
5025 117	5110.0	22.80	•	8.139	7.705	32.721	•	78.957	6.605	113.456	0.986	2.286	41.919	24.886	•	-25.082	19.476	14.664
	5120.0	20.76	•	8.135	7.693	32.351	•	78.573	6.630	123.316	0.985	2.177	41.923	19.639	•	-34.582	17.114	12.624
	5130.0	19.05	•	8.132	7.683	32.069	•	78.282	6.650	133.176	0.984	2.064	41.926	14.477	•	-45.922	15.067	10.919
	5140.0	17.77	•	8.130	7.676	31.877	•	78.079	6.662	143.036	0.984	1.946	41.928	9.400	•	-59.434	13.466	9.636
	5150.0	16.99	•	8.128	7.670	31.777	•	77.959	6.667	152.896	0.984	1.826	41.928	4.406	•	-75.016	12.458	8.858
	5160.0	16.76	•	8.126	7.665	31.767	•	77.918	6.664	162.756	0.984	1.000	41.928	-0.506	•	268.254	12.162	8.635
	5170.0	17.09	•	8.125	7.659	31.847	•	77.950	6.653	172.616	0.984	0.991	41.926	-5.340	•	251.952	12.594	8.962
	5180.0	17.91	•	8.123	7.653	32.013	•	78.052	6.633	182.476	0.984	0.969	41.923	-10.099	•	237.420	13.652	9.783
	5190.0	19.13	•	8.121	7.646	32.264	•	78.219	6.605	192.336	0.984	0.934	41.919	-14.788	•	225.161	15.174	11.006
	5200.0	20.65	•	8.118	7.639	32.595	•	78.450	6.569	202.196	0.984	0.889	41.913	-19.414	•	215.013	17.010	12.536
EDATE	TTIME	CV	SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1		

TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

EDATE	TTIME	DV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
*****															
5075	5160.0	22.75	8.110	7.611	33.177	78.770	6.495	113.755	0.984	2.291	41.901	24.853	-25.103	19.448	14.639
67	5170.0	20.71	8.106	7.599	32.804	78.381	6.521	123.615	0.984	2.182	41.905	19.616	-34.596	17.050	12.604
	5180.0	19.01	8.103	7.589	32.520	78.087	6.540	133.475	0.983	2.068	41.908	14.461	-45.928	15.147	10.902
	5190.0	17.72	8.101	7.582	32.326	77.882	6.553	143.335	0.982	1.950	41.910	9.391	-59.434	13.447	9.622
	5200.0	16.94	8.099	7.576	32.225	77.761	6.558	153.195	0.982	1.829	41.911	4.402	-75.013	12.441	8.845
	5210.0	16.72	8.098	7.570	32.215	77.719	6.555	163.055	0.982	1.000	41.911	-0.505	-268.255	12.145	8.622
	5220.0	17.04	8.096	7.565	32.295	77.751	6.544	172.915	0.982	0.991	41.909	-5.336	-251.948	12.576	8.948
	5230.0	17.86	8.094	7.559	32.464	77.854	6.524	182.775	0.982	0.969	41.906	-10.093	-237.409	13.634	9.769
	5240.0	19.08	8.092	7.553	32.717	78.024	6.496	192.635	0.982	0.934	41.902	-14.782	-225.145	15.157	10.992
	5250.0	20.61	8.090	7.546	33.050	78.258	6.460	202.495	0.983	0.889	41.896	-19.408	-214.992	16.994	12.522
*****															
5125	5210.0	22.70	8.082	7.520	33.635	78.579	6.387	114.054	0.983	2.295	41.885	24.819	-25.128	19.419	14.614
17	5220.0	20.66	8.078	7.507	33.260	78.186	6.413	123.914	0.982	2.186	41.889	19.590	-34.614	17.066	12.583
	5230.0	18.96	8.075	7.497	32.974	77.889	6.433	133.774	0.981	2.071	41.892	14.444	-45.940	15.026	10.885
	5240.0	17.68	8.072	7.490	32.778	77.681	6.446	143.634	0.981	1.953	41.894	9.379	-59.441	13.429	9.607
	5250.0	16.90	8.071	7.484	32.676	77.559	6.451	153.494	0.981	1.832	41.895	4.397	-75.018	12.424	8.832
	5260.0	16.68	8.070	7.478	32.666	77.517	6.448	163.354	0.980	1.000	41.894	-0.507	-268.249	12.128	8.609
	5270.0	17.00	8.068	7.473	32.747	77.550	6.437	173.214	0.980	0.991	41.892	-5.334	-251.936	12.560	8.936
	5280.0	17.82	8.066	7.467	32.917	77.654	6.417	183.074	0.981	0.969	41.889	-10.089	-237.393	13.618	9.756
	5290.0	19.04	8.065	7.462	33.172	77.826	6.389	192.934	0.981	0.934	41.885	-14.778	-225.123	15.141	10.979
	5300.0	20.57	8.063	7.455	33.509	78.063	6.354	202.794	0.981	0.889	41.880	-19.404	-214.967	16.979	12.510
*****															
5175	5260.0	22.64	8.055	7.430	34.096	78.386	6.282	114.353	0.982	2.299	41.869	24.783	-25.157	19.350	14.589
33	5270.0	20.61	8.051	7.417	33.718	77.988	6.308	124.213	0.981	2.189	41.873	19.563	-34.637	17.041	12.562
	5280.0	18.92	8.048	7.407	33.430	77.687	6.327	134.073	0.980	2.075	41.876	14.424	-45.958	15.005	10.868
	5290.0	17.64	8.046	7.400	33.233	77.478	6.340	143.933	0.979	1.956	41.878	9.366	-59.455	13.410	9.593
	5300.0	16.86	8.044	7.394	33.129	77.354	6.346	153.793	0.979	1.835	41.879	4.389	-75.031	12.407	8.819
	5310.0	16.64	8.043	7.388	33.119	77.311	6.343	163.653	0.979	1.000	41.878	-0.511	-268.234	12.112	8.597
	5320.0	16.97	8.041	7.383	33.201	77.345	6.332	173.513	0.979	0.991	41.876	-5.335	-251.918	12.545	8.924
	5330.0	17.78	8.039	7.378	33.372	77.450	6.312	183.373	0.979	0.969	41.874	-10.088	-237.370	13.603	9.744
	5340.0	19.01	8.038	7.372	33.630	77.624	6.285	193.233	0.979	0.934	41.869	-14.776	-225.097	15.127	10.968
	5350.0	20.53	8.036	7.367	33.970	77.865	6.249	203.093	0.980	0.889	41.864	-19.404	-214.938	16.966	12.498
*****															
5225	5310.0	22.59	8.029	7.343	34.559	78.189	6.178	114.652	0.981	2.303	41.854	24.746	-25.190	19.361	14.563
83	5320.0	20.57	8.025	7.329	34.179	77.787	6.204	124.512	0.980	2.193	41.857	19.534	-34.665	17.116	12.541
	5330.0	18.87	8.022	7.319	33.888	77.483	6.224	134.372	0.979	2.078	41.860	14.402	-45.982	14.983	10.850
	5340.0	17.60	8.020	7.312	33.690	77.271	6.237	144.232	0.978	1.960	41.862	9.351	-59.476	13.392	9.578
	5350.0	16.82	8.018	7.306	33.586	77.146	6.242	154.092	0.978	1.838	41.863	4.378	-75.052	12.350	8.807
	5360.0	16.60	8.016	7.300	33.576	77.103	6.240	163.952	0.977	1.000	41.863	-0.517	-268.211	12.057	8.586
	5370.0	16.93	8.015	7.295	33.658	77.137	6.229	173.812	0.977	0.991	41.861	-5.338	-251.892	12.530	8.913
	5380.0	17.75	8.014	7.290	33.831	77.244	6.209	183.672	0.978	0.969	41.858	-10.090	-237.341	13.589	9.733
	5390.0	18.97	8.012	7.285	34.091	77.420	6.182	193.532	0.978	0.934	41.854	-14.777	-225.066	15.114	10.957
	5400.0	20.50	8.011	7.280	34.435	77.664	6.147	203.392	0.979	0.888	41.849	-19.405	-214.905	16.954	12.489
*****															
EDATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

ECATE	TTIME	CV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
4959	5040.0	23.75	8.181	7.838	32.275	79.363	6.743	109.440	0.988	2.318	41.941	26.877	-21.946	20.442	15.516
183	5050.0	21.54	8.176	7.825	31.878	78.950	6.770	114.300	0.987	2.212	41.945	21.588	-30.890	17.984	13.367
	5060.0	19.73	8.173	7.815	31.567	78.630	6.792	129.160	0.987	2.101	41.948	16.384	-41.518	15.803	11.524
	5070.0	16.24	8.171	7.807	31.345	78.399	6.807	139.020	0.986	1.985	41.951	11.265	-54.223	14.018	10.072
	5080.0	14.27	8.169	7.801	31.212	78.252	6.815	148.880	0.986	1.866	41.952	6.233	-65.111	12.774	9.099
	5090.0	12.84	8.167	7.795	31.170	78.184	6.814	158.740	0.986	1.744	41.952	1.284	-85.583	12.208	8.669
	5100.0	16.96	8.165	7.789	31.217	78.190	6.806	168.600	0.986	0.996	41.951	-3.583	257.774	12.379	8.799
	5110.0	17.61	8.163	7.783	31.351	78.265	6.789	178.460	0.986	0.979	41.948	-8.372	242.497	13.226	9.449
	5120.0	18.70	8.161	7.776	31.568	78.406	6.763	188.320	0.986	0.948	41.944	-13.088	225.408	14.597	10.537
	5130.0	20.12	8.159	7.768	31.866	78.611	6.730	198.180	0.986	0.907	41.938	-17.736	218.536	16.332	11.965
4992	5080.0	22.27	8.157	7.764	32.318	78.967	6.685	115.882	0.986	2.255	41.931	23.501	-27.443	18.841	14.109
150	5050.0	20.30	8.154	7.753	31.973	78.610	6.709	125.742	0.986	2.145	41.935	18.271	-37.397	16.549	12.147
	5100.0	18.69	8.151	7.744	31.717	78.345	6.726	135.602	0.985	2.031	41.938	13.127	-49.297	14.605	10.543
	5110.0	17.54	8.149	7.737	31.550	78.167	6.737	145.462	0.985	1.912	41.940	8.067	-63.403	13.146	9.387
	5120.0	16.90	8.147	7.732	31.474	78.069	6.740	155.322	0.985	1.791	41.940	3.092	-75.415	12.318	8.753
	5130.0	16.82	8.145	7.726	31.488	78.048	6.734	165.182	0.985	0.999	41.939	-1.802	263.805	12.220	8.678
	5140.0	17.29	8.144	7.720	31.591	78.099	6.720	175.042	0.985	0.987	41.937	-6.617	247.877	12.832	9.144
	5150.0	18.22	8.142	7.713	31.779	78.217	6.698	184.902	0.985	0.961	41.933	-11.358	233.941	14.030	10.082
	5160.0	19.54	8.135	7.706	32.050	78.400	6.668	194.762	0.985	0.923	41.929	-16.030	222.280	15.649	11.397
	5170.0	21.13	8.137	7.698	32.399	78.646	6.630	204.622	0.985	0.875	41.923	-20.639	212.632	17.547	12.993
5042	5130.0	22.21	8.128	7.669	32.777	78.780	6.574	116.182	0.985	2.259	41.914	23.472	-27.459	18.814	14.086
100	5140.0	20.25	8.124	7.657	32.424	78.420	6.598	126.042	0.984	2.149	41.917	18.251	-37.405	16.526	12.128
	5150.0	18.65	8.121	7.648	32.165	78.152	6.615	135.902	0.984	2.034	41.920	13.114	-49.297	14.585	10.527
	5160.0	17.49	8.119	7.642	31.997	77.971	6.626	145.762	0.983	1.916	41.922	8.061	-63.396	13.128	9.373
	5170.0	16.86	8.118	7.636	31.920	77.872	6.629	155.622	0.983	1.794	41.922	3.091	-79.410	12.301	8.739
	5180.0	16.78	8.116	7.630	31.934	77.851	6.624	165.482	0.983	0.999	41.922	-1.798	263.810	12.202	8.665
	5190.0	17.24	8.114	7.624	32.038	77.902	6.610	175.342	0.983	0.987	41.919	-6.611	247.876	12.814	9.130
	5200.0	18.18	8.112	7.618	32.228	78.022	6.586	185.202	0.983	0.961	41.916	-11.350	233.933	14.012	10.068
	5210.0	19.49	8.110	7.612	32.501	78.208	6.558	195.062	0.983	0.923	41.911	-16.022	222.266	15.631	11.382
	5220.0	21.09	8.108	7.604	32.854	78.456	6.520	204.922	0.984	0.875	41.905	-20.632	212.612	17.530	12.978
5092	5180.0	22.16	8.095	7.576	33.228	78.591	6.465	116.481	0.984	2.264	41.897	23.441	-27.480	18.787	14.062
50	5190.0	20.20	8.096	7.564	32.877	78.226	6.489	126.341	0.983	2.153	41.901	18.229	-37.418	16.503	12.108
	5200.0	18.60	8.093	7.555	32.616	77.955	6.507	136.201	0.982	2.038	41.903	13.099	-49.304	14.565	10.511
	5210.0	17.45	8.091	7.548	32.447	77.772	6.518	146.061	0.982	1.919	41.905	8.053	-63.398	13.109	9.359
	5220.0	16.82	8.089	7.542	32.369	77.672	6.521	155.921	0.981	1.797	41.905	3.088	-79.410	12.284	8.726
	5230.0	16.74	8.087	7.537	32.384	77.651	6.515	165.781	0.981	0.999	41.905	-1.797	263.808	12.185	8.652
	5240.0	17.20	8.086	7.531	32.488	77.702	6.502	175.641	0.981	0.987	41.903	-6.607	247.868	12.757	9.117
	5250.0	18.14	8.084	7.525	32.680	77.824	6.480	185.501	0.982	0.961	41.899	-11.345	233.919	13.995	10.054
	5260.0	19.45	8.082	7.519	32.956	78.012	6.450	195.361	0.982	0.923	41.894	-16.016	222.247	15.615	11.368
	5270.0	21.04	8.080	7.512	33.311	78.264	6.412	205.221	0.982	0.875	41.889	-20.627	212.589	17.514	12.965
5142	5230.0	22.11	8.072	7.485	33.686	78.398	6.358	116.780	0.982	2.268	41.880	23.409	-27.504	18.759	14.038
0	5240.0	20.16	8.068	7.473	33.333	78.029	6.382	126.640	0.981	2.157	41.884	18.205	-37.436	16.480	12.088
	5250.0	18.56	8.065	7.464	33.070	77.755	6.400	136.500	0.981	2.042	41.887	13.083	-49.316	14.545	10.495
	5260.0	17.41	8.063	7.457	32.899	77.570	6.411	146.360	0.980	1.922	41.889	8.042	-63.406	13.091	9.345
	5270.0	16.77	8.061	7.451	32.821	77.469	6.414	156.220	0.980	1.800	41.889	3.083	-79.418	12.267	8.714
	5280.0	16.70	8.060	7.445	32.835	77.447	6.409	166.080	0.980	0.999	41.888	-1.799	263.797	12.169	8.640
	5290.0	17.16	8.058	7.440	32.941	77.500	6.396	175.940	0.980	0.987	41.886	-6.605	247.853	12.781	9.105
	5300.0	18.10	8.056	7.435	33.134	77.623	6.374	185.800	0.980	0.961	41.883	-11.342	233.859	13.979	10.042
	5310.0	19.41	8.055	7.429	33.413	77.813	6.344	195.660	0.980	0.923	41.878	-16.013	222.223	15.600	11.356
	5320.0	21.01	8.053	7.423	33.772	78.069	6.306	205.520	0.981	0.875	41.873	-20.625	212.561	17.500	12.953
ECATE	TTIME	CV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1



TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT															
ECATE	TTIME	CV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
5192	5220.0	22.06	8.045	7.396	34.147	78.202	6.253	117.079	0.981	2.272	41.865	23.375	-27.533	18.731	14.014
317	5290.0	20.11	8.041	7.384	33.792	77.829	6.277	126.939	0.980	2.161	41.868	18.179	-37.459	16.456	12.069
	5300.0	18.52	8.038	7.374	33.527	77.552	6.295	138.799	0.979	2.045	41.871	13.064	-49.335	14.524	10.478
	5310.0	17.37	8.036	7.367	33.354	77.365	6.306	146.659	0.979	1.925	41.873	8.030	-63.422	13.073	9.331
	5320.0	16.14	8.033	7.361	33.276	77.263	6.310	156.519	0.978	1.803	41.873	3.075	-79.434	12.250	8.701
	5330.0	16.66	8.033	7.356	33.290	77.241	6.305	166.379	0.978	0.999	41.872	-1.802	-263.779	12.153	8.628
	5340.0	17.12	8.031	7.351	33.396	77.294	6.291	176.239	0.978	0.987	41.870	-6.607	-247.831	12.766	9.094
	5350.0	18.06	8.030	7.346	33.592	77.419	6.270	186.099	0.979	0.961	41.867	-11.341	-233.873	13.965	10.030
	5360.0	19.37	8.028	7.341	33.873	77.612	6.240	195.959	0.979	0.923	41.863	-16.012	-222.194	15.586	11.345
	5370.0	20.97	8.027	7.335	34.235	77.871	6.203	205.819	0.980	0.875	41.857	-20.625	-212.530	17.468	12.943
5242	5330.0	22.01	8.719	7.309	34.611	78.003	6.150	117.378	0.980	2.276	41.849	23.339	-27.566	18.703	13.989
267	5340.0	20.06	8.015	7.297	34.253	77.626	6.174	127.238	0.979	2.165	41.853	18.151	-37.488	16.432	12.048
	5350.0	18.47	8.013	7.287	33.986	77.346	6.193	137.098	0.978	2.048	41.856	13.043	-49.360	14.504	10.462
	5360.0	17.33	8.010	7.280	33.812	77.157	6.204	146.958	0.977	1.928	41.857	8.015	-63.446	13.056	9.317
	5370.0	16.70	8.009	7.274	33.733	77.054	6.207	156.818	0.977	1.806	41.858	3.065	-79.458	12.234	8.689
	5380.0	16.62	8.007	7.269	33.748	77.032	6.202	166.678	0.977	0.999	41.857	-1.808	-263.753	12.138	8.617
	5390.0	17.09	8.006	7.264	33.855	77.085	6.189	176.538	0.977	0.987	41.855	-6.610	-247.802	12.752	9.083
	5400.0	18.02	8.004	7.259	34.052	77.212	6.168	186.398	0.977	0.961	41.852	-11.343	-233.841	13.952	10.020
	5410.0	19.34	8.003	7.254	34.336	77.407	6.138	196.258	0.978	0.923	41.848	-16.014	-222.160	15.574	11.335
	5420.0	20.93	8.001	7.250	34.702	77.670	6.101	206.118	0.979	0.875	41.842	-20.628	-212.495	17.477	12.933
5292	5330.0	21.96	7.994	7.224	35.077	77.800	6.049	117.677	0.979	2.280	41.835	23.302	-27.602	18.674	13.964
217	5340.0	20.00	7.990	7.212	34.717	77.419	6.074	127.537	0.978	2.168	41.838	18.122	-37.521	16.407	12.028
	5350.0	18.43	7.987	7.202	34.448	77.136	6.092	137.397	0.977	2.052	41.841	13.021	-49.391	14.483	10.445
	5410.0	17.27	7.985	7.194	34.273	76.946	6.103	147.257	0.976	1.931	41.842	7.999	-63.476	13.038	9.303
	5420.0	16.66	7.984	7.189	34.193	76.841	6.106	157.117	0.976	1.808	41.843	3.054	-79.489	12.219	8.677
	5430.0	16.59	7.982	7.184	34.208	76.819	6.102	166.977	0.975	0.999	41.842	-1.817	-263.716	12.124	8.606
	5440.0	17.05	7.981	7.179	34.316	76.873	6.089	176.837	0.976	0.987	41.840	-6.616	-247.769	12.729	9.073
	5450.0	17.99	7.980	7.175	34.515	77.001	6.067	186.697	0.976	0.961	41.837	-11.348	-233.804	13.940	10.010
	5460.0	19.30	7.977	7.170	34.801	77.193	6.036	196.557	0.977	0.923	41.833	-16.018	-222.122	15.563	11.326
	5470.0	20.90	7.977	7.166	35.171	77.466	6.001	206.417	0.977	0.874	41.828	-20.633	-212.457	17.468	12.926
5342	5430.0	21.91	7.970	7.141	35.550	77.592	5.949	117.977	0.978	2.284	41.820	23.264	-27.640	18.645	13.939
167	5440.0	19.97	7.966	7.128	35.183	77.209	5.974	127.837	0.976	2.172	41.824	18.091	-37.558	16.383	12.007
	5450.0	18.39	7.963	7.119	34.912	76.923	5.993	137.697	0.975	2.055	41.827	12.996	-49.427	14.462	10.428
	5460.0	17.25	7.961	7.111	34.736	76.731	6.004	147.557	0.975	1.934	41.828	7.980	-63.512	13.020	9.289
	5470.0	16.62	7.959	7.105	34.656	76.625	6.008	157.417	0.974	1.811	41.829	3.040	-79.527	12.203	8.665
	5480.0	16.55	7.958	7.100	34.671	76.603	6.003	167.276	0.974	0.999	41.828	-1.827	-263.678	12.110	8.596
	5490.0	17.02	7.957	7.096	34.780	76.658	5.990	177.137	0.974	0.987	41.826	-6.623	-247.723	12.727	9.063
	5500.0	17.96	7.956	7.092	34.981	76.768	5.969	186.997	0.975	0.961	41.823	-11.354	-233.761	13.929	10.002
	5510.0	19.27	7.954	7.088	35.270	76.967	5.939	196.857	0.975	0.923	41.819	-16.025	-222.080	15.554	11.318
	5520.0	20.87	7.953	7.084	35.643	77.258	5.902	206.716	0.976	0.874	41.814	-20.641	-212.415	17.460	12.919
5392	5430.0	21.86	7.946	7.060	36.020	77.383	5.852	118.276	0.976	2.288	41.807	23.223	-27.684	18.616	13.914
117	5440.0	19.93	7.942	7.047	35.652	76.996	5.877	128.136	0.975	2.175	41.810	18.058	-37.600	16.358	11.986
	5500.0	18.35	7.940	7.037	35.377	76.707	5.896	137.996	0.974	2.058	41.813	12.970	-49.469	14.441	10.411
	5510.0	17.21	7.938	7.030	35.202	76.512	5.907	147.856	0.973	1.937	41.814	7.959	-63.556	13.022	9.275
	5520.0	16.59	7.936	7.024	35.121	76.406	5.911	157.716	0.973	1.813	41.815	3.024	-79.573	12.188	8.654
	5530.0	16.52	7.935	7.019	35.137	76.383	5.906	167.576	0.973	0.999	41.814	-1.839	-263.630	12.057	8.586
	5540.0	16.99	7.934	7.015	35.247	76.440	5.893	177.436	0.973	0.986	41.812	-6.634	-247.675	12.715	9.055
	5550.0	17.93	7.932	7.011	35.450	76.571	5.872	187.296	0.973	0.961	41.809	-11.363	-233.714	13.919	9.994
	5560.0	19.24	7.931	7.008	35.741	76.774	5.843	197.156	0.974	0.923	41.805	-16.034	-222.034	15.546	11.311
	5570.0	20.84	7.931	7.004	36.118	77.048	5.806	207.016	0.975	0.874	41.800	-20.651	-212.369	17.454	12.913
ECATE	TTIME	CV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

EDATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
5442	5530.0	21.81	7.924	6.981	36.493	77.170	5.756	118.575	0.975	2.292	41.793	23.181	-27.732	18.586	13.888
67	5540.0	19.89	7.920	6.967	36.128	76.777	5.781	128.435	0.974	2.179	41.797	18.024	-37.644	16.333	11.966
	5550.0	18.31	7.917	6.958	35.849	76.487	5.800	138.295	0.973	2.061	41.799	12.942	-49.516	14.420	10.394
	5560.0	17.18	7.915	6.950	35.670	76.290	5.812	148.155	0.972	1.940	41.801	7.937	-63.606	12.964	9.261
	5570.0	16.56	7.912	6.944	35.589	76.183	5.815	158.015	0.972	1.816	41.801	3.006	-79.627	12.173	8.643
	5580.0	16.49	7.912	6.939	35.605	76.160	5.811	167.875	0.972	0.999	41.801	-1.854	263.575	12.085	8.577
	5590.0	16.96	7.911	6.935	35.716	76.217	5.798	177.735	0.972	0.986	41.799	-6.646	247.620	12.705	9.047
	5600.0	17.90	7.910	6.932	35.921	76.351	5.777	187.595	0.972	0.961	41.796	-11.374	233.661	13.910	9.987
	5610.0	19.21	7.909	6.929	36.215	76.557	5.748	197.455	0.973	0.923	41.792	-16.045	221.983	15.539	11.306
	5620.0	20.82	7.909	6.926	36.595	76.834	5.711	207.315	0.974	0.874	41.787	-20.663	212.320	17.449	12.909
5492	5580.0	21.76	7.902	6.904	36.968	76.953	5.662	118.874	0.974	2.295	41.780	23.137	-27.784	18.556	13.862
17	5590.0	19.84	7.898	6.890	36.600	76.556	5.687	128.734	0.973	2.182	41.784	17.988	-37.695	16.307	11.944
	5600.0	18.27	7.895	6.880	36.321	76.263	5.706	138.594	0.972	2.064	41.786	12.912	-49.569	14.398	10.377
	5610.0	17.14	7.893	6.872	36.141	76.065	5.718	148.454	0.971	1.943	41.788	7.913	-63.662	12.966	9.248
	5620.0	16.52	7.892	6.866	36.060	75.957	5.722	158.314	0.970	1.818	41.789	2.986	-79.686	12.158	8.632
	5630.0	16.46	7.890	6.862	36.076	75.934	5.717	168.174	0.970	0.999	41.788	-1.871	263.513	12.073	8.568
	5640.0	16.93	7.889	6.858	36.189	75.992	5.704	178.034	0.971	0.986	41.786	-6.660	247.559	12.696	9.040
	5650.0	17.87	7.888	6.855	36.395	76.127	5.683	187.894	0.971	0.960	41.783	-11.387	233.602	13.903	9.981
	5660.0	19.19	7.888	6.852	36.692	76.336	5.654	197.754	0.972	0.922	41.779	-16.058	221.928	15.533	11.301
	5670.0	20.79	7.887	6.850	37.075	76.617	5.618	207.614	0.973	0.874	41.774	-20.677	212.268	17.445	12.906
5542	5630.0	21.72	7.881	6.828	37.445	76.733	5.570	119.173	0.973	2.299	41.768	23.092	-27.838	18.526	13.836
33	5640.0	19.80	7.877	6.814	37.076	76.332	5.595	129.033	0.972	2.185	41.771	17.950	-37.751	16.282	11.923
	5650.0	18.23	7.874	6.803	36.800	76.034	5.613	138.893	0.971	2.067	41.774	12.882	-49.624	14.377	10.360
	5660.0	17.11	7.872	6.796	36.615	75.835	5.626	148.753	0.970	1.945	41.776	7.887	-63.724	12.948	9.234
	5670.0	16.49	7.870	6.790	36.533	75.726	5.630	158.613	0.969	1.820	41.776	2.964	-79.753	12.144	8.621
	5680.0	16.43	7.869	6.786	36.550	75.704	5.625	168.473	0.969	0.999	41.775	-1.889	263.444	12.62	8.559
	5690.0	16.90	7.868	6.782	36.664	75.763	5.613	178.333	0.969	0.986	41.774	-6.676	247.492	12.687	9.033
	5700.0	17.84	7.867	6.779	36.872	75.900	5.592	188.193	0.970	0.960	41.771	-11.403	233.535	13.896	9.976
	5710.0	19.16	7.867	6.777	37.172	76.112	5.563	198.053	0.971	0.922	41.767	-16.073	221.865	15.529	11.297
	5720.0	20.77	7.867	6.776	37.558	76.397	5.526	207.913	0.972	0.873	41.762	-20.694	212.213	17.442	12.904
5592	5680.0	21.67	7.861	6.755	37.925	76.509	5.479	119.472	0.972	2.303	41.756	23.046	-27.896	18.495	13.809
83	5690.0	19.76	7.857	6.740	37.554	76.104	5.504	129.332	0.971	2.189	41.759	17.911	-37.811	16.255	11.901
	5700.0	18.20	7.854	6.729	37.276	75.803	5.523	139.192	0.969	2.070	41.762	12.849	-49.687	14.355	10.342
	5710.0	17.07	7.851	6.721	37.096	75.600	5.534	149.052	0.969	1.948	41.763	7.860	-63.788	12.931	9.220
	5720.0	16.46	7.850	6.716	37.009	75.492	5.539	158.912	0.968	1.822	41.764	2.940	-79.827	12.130	8.610
	5730.0	16.40	7.849	6.711	37.026	75.470	5.535	168.772	0.968	0.999	41.763	-1.909	263.369	12.051	8.551
	5740.0	16.87	7.848	6.708	37.141	75.530	5.522	178.632	0.968	0.986	41.762	-6.695	247.419	12.679	9.027
	5750.0	17.82	7.847	6.705	37.351	75.669	5.502	188.492	0.969	0.960	41.759	-11.420	233.471	13.891	9.972
	5760.0	19.14	7.847	6.704	37.654	75.884	5.473	198.352	0.970	0.922	41.755	-16.090	221.806	15.525	11.294
	5770.0	20.75	7.847	6.703	38.044	76.173	5.436	208.212	0.971	0.873	41.750	-20.712	212.154	17.441	12.902
EDATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	CV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMD	VEL1	ALPHA1	PHI1	VINF1	DV1
5326	5410.0	22.71	7.975	7.174	35.551	77.825	5.971	114.260	0.979	2.323	41.823	25.196	-24.394	19.550	14.729
183	5420.0	20.66	7.975	7.160	35.153	77.407	5.998	124.120	0.977	2.212	41.827	19.991	-33.701	17.188	12.687
	5430.0	18.94	7.972	7.149	34.849	77.087	6.019	133.980	0.976	2.097	41.830	14.866	-44.807	15.127	10.967
	5440.0	17.63	7.970	7.141	34.638	76.861	6.033	143.840	0.975	1.978	41.832	9.819	-58.073	13.490	9.656
	5450.0	16.80	7.968	7.134	34.523	76.725	6.039	153.700	0.975	1.856	41.833	4.849	-73.466	12.427	8.835
	5460.0	16.53	7.966	7.129	34.503	76.673	6.038	163.560	0.975	1.000	41.833	-0.045	-265.843	12.063	8.560
	5470.0	16.80	7.965	7.125	34.578	76.700	6.028	173.420	0.975	0.993	41.832	-4.868	-253.404	12.428	8.836
	5480.0	17.57	7.964	7.120	34.745	76.802	6.009	183.280	0.975	0.972	41.829	-9.623	-238.634	13.433	9.611
	5490.0	16.76	7.963	7.116	35.001	76.976	5.983	193.140	0.975	0.938	41.825	-14.315	-226.127	14.521	10.800
	5500.0	20.27	7.961	7.112	35.342	77.220	5.949	203.000	0.976	0.893	41.820	-18.950	-215.769	16.738	12.306
5360	5440.0	23.49	7.965	7.125	36.034	77.870	5.894	110.842	0.978	2.364	41.812	27.094	-21.377	20.450	15.523
150	5450.0	21.35	7.960	7.109	35.608	77.407	5.922	120.702	0.977	2.256	41.816	21.868	-30.124	18.007	13.388
	5460.0	19.50	7.957	7.097	35.264	77.050	5.946	130.562	0.976	2.142	41.820	16.718	-40.522	15.825	11.542
	5470.0	18.03	7.954	7.088	35.018	76.788	5.963	140.422	0.975	2.024	41.822	11.646	-52.968	14.019	10.073
	5480.0	17.02	7.952	7.081	34.867	76.619	5.972	150.282	0.974	1.903	41.824	6.652	-67.629	12.730	9.066
	5490.0	16.54	7.951	7.075	34.812	76.536	5.973	160.142	0.974	1.778	41.824	1.733	-83.595	12.101	8.589
	5500.0	16.62	7.950	7.071	34.852	76.534	5.966	170.002	0.974	0.997	41.823	-3.113	-259.275	12.204	8.666
	5510.0	17.22	7.948	7.067	34.986	76.610	5.951	179.862	0.974	0.981	41.821	-7.891	-243.773	12.952	9.268
	5520.0	16.26	7.947	7.063	35.212	76.760	5.928	189.722	0.974	0.952	41.817	-12.605	-230.421	14.323	10.316
	5530.0	19.66	7.946	7.059	35.525	76.980	5.897	199.582	0.975	0.911	41.813	-17.260	-219.314	16.036	11.717
5410	5490.0	23.44	7.942	7.045	36.507	77.663	5.797	111.142	0.977	2.369	41.799	27.046	-21.424	20.417	15.494
100	5500.0	21.30	7.937	7.028	36.078	77.195	5.825	121.002	0.976	2.260	41.803	21.829	-30.165	17.979	13.363
	5510.0	19.46	7.934	7.016	35.733	76.834	5.849	130.862	0.974	2.146	41.806	16.686	-40.565	15.801	11.523
	5520.0	17.99	7.931	7.007	35.485	76.570	5.866	140.722	0.973	2.027	41.809	11.621	-53.013	13.958	10.057
	5530.0	16.98	7.929	7.000	35.333	76.390	5.875	150.582	0.973	1.905	41.810	6.632	-67.675	12.713	9.053
	5540.0	16.51	7.928	6.995	35.276	76.315	5.877	160.442	0.972	1.781	41.810	1.718	-84.048	12.086	8.578
	5550.0	16.53	7.926	6.990	35.319	76.314	5.870	170.302	0.972	0.997	41.809	-3.126	-259.224	12.192	8.657
	5560.0	17.18	7.925	6.986	35.455	76.391	5.855	180.162	0.973	0.981	41.807	-7.901	-243.723	12.982	9.259
	5570.0	16.23	7.924	6.982	35.682	76.542	5.832	190.022	0.973	0.952	41.804	-12.614	-230.372	14.314	10.309
	5580.0	19.63	7.923	6.979	35.998	76.766	5.801	199.882	0.974	0.911	41.799	-17.270	-219.267	16.028	11.711
5460	5540.0	23.38	7.920	6.967	36.983	77.453	5.702	111.441	0.976	2.373	41.786	26.998	-21.474	20.384	15.464
50	5550.0	21.25	7.915	6.950	36.551	76.980	5.730	121.301	0.975	2.263	41.790	21.788	-30.218	17.950	13.339
	5560.0	19.41	7.911	6.937	36.204	76.613	5.753	131.161	0.973	2.149	41.793	16.654	-40.610	15.777	11.503
	5570.0	17.95	7.909	6.928	35.955	76.348	5.771	141.021	0.972	2.030	41.795	11.594	-53.063	13.978	10.041
	5580.0	16.95	7.907	6.921	35.802	76.175	5.781	150.881	0.972	1.908	41.797	6.611	-67.728	12.696	9.040
	5590.0	16.47	7.905	6.915	35.747	76.091	5.782	160.741	0.971	1.783	41.797	1.700	-84.104	12.072	8.567
	5600.0	16.55	7.904	6.911	35.789	76.090	5.775	170.601	0.971	0.997	41.796	-3.140	-259.166	12.180	8.648
	5610.0	17.16	7.903	6.907	35.926	76.168	5.761	180.461	0.971	0.981	41.794	-7.914	-243.666	12.972	9.252
	5620.0	16.21	7.902	6.904	36.155	76.321	5.737	190.321	0.972	0.952	41.791	-12.626	-230.318	14.306	10.303
	5630.0	19.61	7.901	6.901	36.474	76.548	5.706	200.181	0.973	0.911	41.786	-17.282	-219.215	16.022	11.706
5510	5540.0	23.33	7.899	6.891	37.460	77.238	5.608	111.740	0.975	2.376	41.773	26.948	-21.527	20.350	15.435
C	5550.0	21.21	7.894	6.873	37.027	76.761	5.637	121.600	0.974	2.267	41.777	21.746	-30.271	17.922	13.314
	5560.0	19.37	7.890	6.860	36.683	76.390	5.660	131.460	0.972	2.152	41.780	16.619	-40.664	15.753	11.483
	5570.0	17.91	7.887	6.851	36.428	76.123	5.678	141.320	0.971	2.033	41.783	11.565	-53.118	13.957	10.025
	5580.0	16.91	7.885	6.844	36.274	75.948	5.688	151.180	0.970	1.911	41.784	6.587	-67.788	12.679	9.027
	5590.0	16.44	7.884	6.839	36.219	75.863	5.689	161.040	0.970	1.785	41.784	1.681	-84.167	12.058	8.557
	5600.0	16.52	7.883	6.834	36.261	75.862	5.683	170.900	0.970	0.997	41.783	-3.157	-259.102	12.169	8.640
	5610.0	17.13	7.882	6.830	36.399	75.941	5.668	180.760	0.970	0.981	41.781	-7.929	-243.604	12.963	9.245
	5620.0	16.18	7.881	6.828	36.631	76.097	5.645	190.620	0.971	0.951	41.778	-12.640	-230.259	14.300	10.298
	5630.0	19.54	7.880	6.825	36.952	76.327	5.613	200.480	0.972	0.910	41.774	-17.296	-219.160	16.018	11.702
ECATE	TTIME	CV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMD	VEL1	ALPHA1	PHI1	VINF1	DV1

ECATE	TIME	CV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
556C	5640.0	25.25	*	7.878	6.816	37.940	77.020	5.517	112.039	0.974	2.380	41.761	26.896	-21.583	20.316	15.405
317	5650.0	21.16	*	7.873	6.798	37.504	76.538	5.546	121.899	0.973	2.271	41.765	21.702	-30.327	17.852	13.289
	5660.0	19.33	*	7.869	6.785	37.158	76.164	5.569	131.759	0.971	2.156	41.768	16.582	-40.722	15.728	11.462
	5670.0	17.87	*	7.866	6.775	36.908	75.891	5.586	141.619	0.970	2.036	41.770	11.536	-53.175	13.937	10.008
	5680.0	16.88	*	7.864	6.768	36.748	75.717	5.596	151.479	0.969	1.913	41.772	6.561	-67.854	12.662	9.614
	5690.0	16.41	*	7.863	6.763	36.693	75.631	5.598	161.339	0.969	1.787	41.772	1.659	-84.237	12.045	8.547
	5700.0	16.49	*	7.862	6.759	36.736	75.631	5.591	171.199	0.969	0.997	41.771	-3.175	-259.031	12.159	8.632
	5710.0	17.10	*	7.861	6.755	36.875	75.711	5.576	181.059	0.969	0.981	41.769	-7.945	-243.536	12.955	9.239
	5720.0	18.15	*	7.860	6.753	37.109	75.869	5.553	190.919	0.970	0.951	41.766	-17.656	-230.195	14.294	10.293
	5730.0	19.56	*	7.860	6.751	37.433	76.107	5.522	200.779	0.971	0.910	41.762	-17.312	-219.100	16.014	11.699
561C	5650.0	25.23	*	7.858	6.743	38.422	76.799	5.427	112.338	0.974	2.384	41.749	26.844	-21.642	20.282	15.374
267	5700.0	21.12	*	7.853	6.725	37.984	76.312	5.456	122.198	0.972	2.274	41.753	21.657	-30.386	17.863	13.263
	5710.0	19.29	*	7.849	6.711	37.636	75.933	5.479	132.058	0.970	2.159	41.756	16.544	-40.783	15.703	11.441
	5720.0	17.64	*	7.846	6.701	37.384	75.658	5.496	141.918	0.969	2.039	41.758	11.504	-53.242	13.916	9.992
	5730.0	16.89	*	7.844	6.694	37.230	75.480	5.505	151.778	0.968	1.916	41.759	6.536	-67.922	12.665	9.001
	5740.0	16.34	*	7.843	6.689	37.169	75.396	5.508	161.638	0.968	1.789	41.760	1.636	-84.314	12.032	8.537
	5750.0	16.47	*	7.842	6.685	37.213	75.396	5.502	171.498	0.968	0.997	41.759	-3.196	-258.954	12.149	8.625
	5760.0	17.07	*	7.841	6.682	37.354	75.478	5.487	181.358	0.968	0.980	41.757	-7.964	-243.462	12.949	9.234
	5770.0	18.13	*	7.840	6.680	37.590	75.638	5.464	191.218	0.969	0.951	41.754	-12.674	-230.127	14.289	10.289
	5780.0	19.54	*	7.840	6.678	37.917	75.874	5.433	201.078	0.970	0.910	41.750	-17.331	-219.038	16.012	11.697
566C	5740.0	25.11	*	7.839	6.672	38.906	76.573	5.338	112.637	0.973	2.388	41.738	26.790	-21.704	20.248	15.344
217	5790.0	21.07	*	7.833	6.654	38.466	76.081	5.367	122.497	0.971	2.277	41.742	21.611	-30.449	17.833	13.238
	5800.0	19.25	*	7.829	6.640	38.117	75.699	5.391	132.357	0.969	2.162	41.745	16.504	-40.850	15.678	11.420
	5810.0	17.63	*	7.826	6.629	37.864	75.421	5.408	142.217	0.968	2.041	41.747	11.470	-53.314	13.855	9.975
	5820.0	16.81	*	7.824	6.621	37.709	75.242	5.417	152.077	0.967	1.918	41.748	6.506	-68.000	12.629	8.988
	5830.0	16.43	*	7.822	6.617	37.649	75.157	5.426	161.937	0.967	1.791	41.748	1.611	-84.397	12.019	8.527
	5840.0	16.44	*	7.822	6.613	37.693	75.157	5.413	171.797	0.967	0.997	41.747	-3.218	-258.870	12.140	8.618
	5850.0	17.05	*	7.821	6.610	37.836	75.240	5.399	181.657	0.967	0.980	41.746	-7.984	-243.383	12.942	9.229
	5860.0	18.11	*	7.821	6.608	38.074	75.403	5.376	191.517	0.968	0.951	41.743	-12.693	-230.055	14.266	10.287
	5870.0	19.52	*	7.821	6.607	38.404	75.642	5.345	201.377	0.969	0.910	41.739	-17.351	-218.971	16.010	11.696
571C	5750.0	25.13	*	7.819	6.603	39.393	76.343	5.251	112.937	0.972	2.391	41.727	26.735	-21.768	20.213	15.313
167	5800.0	21.03	*	7.814	6.584	38.951	75.846	5.280	122.797	0.970	2.281	41.730	21.563	-30.515	17.803	13.212
	5810.0	19.21	*	7.810	6.569	38.600	75.461	5.304	132.656	0.968	2.165	41.733	16.463	-40.920	15.652	11.399
	5820.0	17.77	*	7.808	6.559	38.345	75.181	5.321	142.517	0.967	2.044	41.736	11.434	-53.391	13.874	9.958
	5830.0	16.78	*	7.805	6.551	38.190	74.999	5.331	152.377	0.966	1.920	41.737	6.476	-68.085	12.612	8.975
	5840.0	16.32	*	7.804	6.545	38.135	74.911	5.332	162.237	0.966	1.793	41.737	1.585	-84.482	12.007	8.518
	5850.0	16.41	*	7.803	6.542	38.175	74.915	5.327	172.096	0.966	0.997	41.736	-3.242	-258.781	12.131	8.611
	5860.0	17.03	*	7.802	6.540	38.320	74.999	5.312	181.957	0.966	0.980	41.734	-8.007	-243.298	12.937	9.225
	5870.0	18.09	*	7.802	6.539	38.560	75.164	5.289	191.817	0.967	0.951	41.732	-12.715	-229.978	14.283	10.285
	5880.0	19.50	*	7.802	6.538	38.893	75.406	5.258	201.677	0.968	0.909	41.728	-17.373	-218.901	16.010	11.696
576C	5840.0	25.08	*	7.801	6.534	39.881	76.109	5.165	113.236	0.971	2.395	41.716	26.679	-21.835	20.178	15.282
117	5890.0	21.08	*	7.796	6.515	39.437	75.607	5.195	123.096	0.969	2.284	41.720	21.514	-30.584	17.773	13.186
	5900.0	19.17	*	7.792	6.501	39.085	75.218	5.219	132.956	0.967	2.167	41.723	16.421	-40.995	15.627	11.378
	5910.0	17.73	*	7.785	6.490	38.829	74.936	5.236	142.816	0.966	2.047	41.725	11.397	-53.473	13.853	9.942
	5920.0	16.75	*	7.787	6.482	38.673	74.753	5.245	152.676	0.965	1.922	41.726	6.443	-68.176	12.595	8.963
	5930.0	16.29	*	7.786	6.477	38.619	74.665	5.247	162.536	0.965	1.795	41.726	1.556	-84.579	11.954	8.509
	5940.0	16.39	*	7.785	6.473	38.666	74.665	5.241	172.396	0.965	0.997	41.725	-3.267	-258.689	12.123	8.605
	5950.0	17.01	*	7.784	6.471	38.806	74.754	5.227	182.256	0.965	0.980	41.724	-8.031	-243.209	12.933	9.222
	5960.0	18.07	*	7.784	6.470	39.049	74.921	5.204	192.116	0.966	0.951	41.721	-12.739	-229.896	14.282	10.283
	5970.0	19.48	*	7.784	6.470	39.384	75.167	5.173	201.976	0.967	0.909	41.717	-17.397	-218.828	16.011	11.697
ECATE	TIME	CV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	DV SUM	DV2	VIAF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMD	VEL1	ALPHA1	PHI1	VINF1	DV1
5810	5850.0	23.03	7.782	6.468	40.372	75.871	5.081	113.535	0.970	2.399	41.706	26.621	-21.904	20.142	15.251
67	5900.0	20.94	7.774	6.448	39.926	75.364	5.111	123.395	0.968	2.287	41.709	21.464	-30.657	17.742	13.160
	5910.0	17.13	7.774	6.434	39.572	74.972	5.135	133.255	0.966	2.170	41.712	16.377	-41.073	15.601	11.357
	5920.0	14.10	7.771	6.423	39.315	74.687	5.152	143.115	0.965	2.049	41.714	11.359	-53.560	13.832	9.925
	5930.0	10.12	7.769	6.415	39.150	74.503	5.162	152.975	0.964	1.924	41.716	6.409	-68.272	12.578	8.950
	5940.0	6.27	7.767	6.409	39.105	74.414	5.163	162.835	0.964	1.797	41.716	1.526	-84.681	11.983	8.500
	5950.0	2.31	7.767	6.406	39.152	74.415	5.157	172.695	0.964	0.997	41.715	-3.295	-98.587	12.116	8.600
	5960.0	16.94	7.766	6.404	39.300	74.502	5.142	182.555	0.964	0.980	41.713	-8.056	-243.118	12.929	9.219
	5970.0	13.05	7.766	6.404	39.540	74.674	5.120	192.415	0.965	0.950	41.711	-12.764	-224.811	14.261	10.283
	5980.0	17.47	7.767	6.404	39.875	74.924	5.093	202.275	0.965	0.909	41.707	-17.423	-218.751	16.013	11.698
5860	5940.0	22.97	7.766	6.403	40.864	75.628	4.999	113.834	0.967	2.402	41.696	26.563	-71.976	20.107	15.219
17	5950.0	20.09	7.761	6.383	40.417	75.117	5.029	123.694	0.967	2.290	41.699	21.413	-80.733	17.711	13.133
	5960.0	17.05	7.757	6.354	40.062	74.721	5.052	133.554	0.965	2.173	41.702	16.331	-91.155	15.574	11.335
	5970.0	14.06	7.754	6.357	39.804	74.433	5.070	143.414	0.964	2.051	41.704	11.319	-103.652	13.810	9.908
	5980.0	10.69	7.752	6.349	39.647	74.248	5.079	153.274	0.963	1.926	41.705	6.374	-118.373	12.562	8.937
	5990.0	6.24	7.751	6.344	39.593	74.159	5.081	163.134	0.963	1.799	41.706	1.494	-134.790	11.971	8.491
	6000.0	10.34	7.750	6.340	39.642	74.161	5.075	172.994	0.963	0.997	41.705	-3.324	-158.480	12.109	8.594
	6010.0	16.97	7.745	6.338	39.791	74.249	5.060	182.854	0.963	0.980	41.703	-8.084	-184.018	12.266	9.216
	6020.0	10.03	7.745	6.338	40.033	74.420	5.037	192.714	0.964	0.950	41.700	-12.791	-209.725	14.261	10.283
	6030.0	17.45	7.750	6.339	40.360	74.673	5.007	202.574	0.965	0.908	41.697	-17.450	-218.674	16.15	11.700
5910	5930.0	22.94	7.750	6.339	41.358	75.381	4.915	114.133	0.964	2.405	41.686	26.503	-72.051	20.071	15.187
33	6000.0	20.05	7.745	6.319	40.907	74.865	4.947	123.993	0.966	2.293	41.690	21.360	-80.812	17.680	13.107
	6010.0	17.05	7.741	6.304	40.553	74.466	4.971	133.853	0.964	2.176	41.692	16.285	-91.242	15.548	11.313
	6020.0	14.05	7.738	6.293	40.295	74.176	4.989	143.713	0.963	2.054	41.695	11.277	-103.748	13.789	9.891
	6030.0	10.66	7.736	6.265	40.138	73.989	4.999	153.573	0.962	1.928	41.696	6.336	-118.481	12.545	8.925
	6040.0	6.22	7.734	6.273	40.084	73.899	5.000	163.433	0.962	1.800	41.696	1.460	-134.904	11.960	8.483
	6050.0	10.36	7.733	6.276	40.133	73.901	4.994	173.293	0.962	0.997	41.695	-3.355	-158.367	12.102	8.590
	6060.0	16.95	7.732	6.274	40.284	73.991	4.979	183.153	0.962	0.980	41.693	-8.114	-184.913	12.253	9.215
	6070.0	10.02	7.732	6.274	40.534	74.166	4.957	193.013	0.963	0.950	41.691	-12.820	-209.931	14.262	10.284
	6080.0	17.44	7.732	6.276	40.879	74.422	4.926	202.873	0.964	0.908	41.687	-17.479	-218.590	16.19	11.704
5960	6030.0	22.87	7.734	6.277	41.854	75.130	4.838	114.432	0.968	2.409	41.677	26.443	-72.128	20.034	15.155
63	6040.0	20.01	7.727	6.257	41.404	74.699	4.868	124.292	0.966	2.296	41.680	21.306	-80.893	17.648	13.080
	6050.0	17.07	7.724	6.241	41.047	74.306	4.892	134.152	0.964	2.178	41.683	16.237	-91.332	15.521	11.291
	6060.0	14.08	7.722	6.230	40.788	73.913	4.909	144.012	0.962	2.056	41.685	11.234	-103.845	13.767	9.873
	6070.0	10.63	7.719	6.222	40.631	73.725	4.919	153.872	0.961	1.930	41.686	6.298	-118.593	12.529	8.912
	6080.0	6.13	7.717	6.216	40.577	73.635	4.921	163.732	0.961	1.802	41.686	1.425	-134.023	11.949	8.475
	6090.0	10.30	7.717	6.213	40.627	73.639	4.915	173.592	0.961	0.996	41.686	-3.388	-158.248	12.096	8.585
	6100.0	16.93	7.717	6.212	40.779	73.737	4.900	183.452	0.961	0.980	41.684	-8.145	-184.804	12.222	9.214
	6120.0	10.00	7.717	6.212	41.031	73.907	4.877	193.312	0.962	0.950	41.681	-12.851	-209.533	14.264	10.285
	6130.0	17.43	7.717	6.214	41.379	74.167	4.847	203.172	0.964	0.908	41.678	-17.511	-218.504	16.225	11.708
ECATE	TTIME	DV SUM	DV2	VIAF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMD	VEL1	ALPHA1	PHI1	VINF1	DV1

ECATE	TIME	CV	SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1		
5693 183	5770.0	23.98	•	7.828	6.633	39.417	•	76.629	5.267	109.220	0.973	2.429	41.729	28.670	•	-18.870	21.157	16.152
	5780.0	21.78	•	7.822	6.613	38.944	•	76.092	5.298	119.080	0.971	2.321	41.733	23.470	•	-27.113	18.673	13.963
	5790.0	19.85	•	7.818	6.597	38.559	•	75.668	5.324	128.940	0.969	2.207	41.736	18.341	•	-36.858	16.414	12.034
	5800.0	18.26	•	7.815	6.585	38.270	•	75.350	5.344	138.800	0.968	2.088	41.739	13.284	•	-48.529	14.482	10.445
	5810.0	17.09	•	7.812	6.576	38.078	•	75.134	5.356	148.660	0.967	1.965	41.740	8.298	•	-62.420	13.012	9.283
	5820.0	16.44	•	7.811	6.570	37.986	•	75.013	5.361	158.520	0.966	1.840	41.741	3.382	•	-78.308	12.150	8.626
	5830.0	16.33	•	7.810	6.566	37.990	•	74.984	5.358	168.380	0.966	0.999	41.740	-1.470	•	-264.883	12.004	8.516
	5840.0	16.75	•	7.809	6.563	38.097	•	75.038	5.346	178.240	0.966	0.988	41.739	-6.257	•	-248.787	12.572	8.945
	5850.0	17.66	•	7.808	6.562	38.302	•	75.173	5.327	188.100	0.967	0.963	41.736	-10.986	•	-234.623	13.738	9.851
	5860.0	18.95	•	7.808	6.561	38.601	•	75.386	5.299	197.960	0.968	0.926	41.733	-15.662	•	-222.747	15.341	11.143
5727 150	5810.0	22.53	•	7.811	6.573	39.436	•	76.118	5.229	115.662	0.971	2.364	41.724	25.334	•	-23.979	19.540	14.720
	5820.0	20.50	•	7.807	6.556	39.016	•	75.650	5.257	125.522	0.969	2.251	41.728	20.184	•	-23.126	17.192	12.690
	5830.0	18.77	•	7.803	6.542	38.690	•	75.292	5.279	135.382	0.967	2.134	41.730	15.105	•	-44.047	15.129	10.969
	5840.0	17.44	•	7.801	6.532	38.462	•	75.038	5.295	145.242	0.966	2.012	41.732	10.097	•	-57.116	13.475	9.644
	5850.0	16.60	•	7.799	6.525	38.333	•	74.882	5.302	155.102	0.965	1.887	41.733	5.158	•	-72.354	12.376	8.796
	5860.0	16.28	•	7.797	6.520	38.305	•	74.818	5.302	164.962	0.965	1.760	41.733	0.286	•	-89.002	11.964	8.486
	5870.0	16.52	•	7.797	6.518	38.372	•	74.844	5.294	174.822	0.965	0.994	41.732	-4.524	•	-254.455	12.281	8.724
	5880.0	17.26	•	7.796	6.516	38.543	•	74.951	5.277	184.682	0.966	0.974	41.730	-9.272	•	-239.500	13.248	9.466
	5890.0	18.42	•	7.796	6.515	38.809	•	75.137	5.252	194.542	0.967	0.941	41.727	-13.967	•	-226.796	14.711	10.629
	5900.0	19.92	•	7.796	6.515	39.167	•	75.402	5.219	204.402	0.968	0.896	41.723	-18.612	•	-216.269	16.516	12.119
5777 100	5860.0	22.48	•	7.793	6.506	39.924	•	75.882	5.145	115.962	0.970	2.367	41.713	25.279	•	-24.048	19.506	14.690
	5870.0	20.45	•	7.789	6.488	39.503	•	75.409	5.173	125.822	0.968	2.254	41.717	20.136	•	-33.198	17.162	12.665
	5880.0	18.73	•	7.785	6.474	39.176	•	75.048	5.195	135.682	0.966	2.137	41.720	15.063	•	-44.125	15.104	10.949
	5890.0	17.41	•	7.782	6.464	38.946	•	74.792	5.210	145.542	0.965	2.015	41.722	10.060	•	-57.202	13.455	9.628
	5900.0	16.57	•	7.780	6.457	38.817	•	74.634	5.217	155.402	0.964	1.889	41.723	5.126	•	-72.448	12.361	8.785
	5910.0	16.26	•	7.779	6.452	38.790	•	74.570	5.217	165.262	0.964	1.762	41.722	0.257	•	-85.101	11.553	8.478
	5920.0	16.50	•	7.778	6.449	38.864	•	74.594	5.208	175.122	0.964	0.994	41.721	-4.548	•	-254.363	12.274	8.719
	5930.0	17.24	•	7.778	6.448	39.031	•	74.705	5.192	184.982	0.965	0.973	41.719	-9.297	•	-239.411	13.244	9.463
	5940.0	18.41	•	7.778	6.447	39.299	•	74.894	5.168	194.842	0.966	0.941	41.716	-13.991	•	-226.716	14.710	10.629
	5950.0	19.90	•	7.778	6.448	39.660	•	75.162	5.135	204.702	0.967	0.896	41.712	-18.637	•	-216.196	16.518	12.121
5827 50	5910.0	22.44	•	7.776	6.440	40.415	•	75.641	5.061	116.261	0.969	2.371	41.703	25.224	•	-24.119	19.472	14.660
	5920.0	20.41	•	7.771	6.421	39.997	•	75.163	5.089	126.121	0.967	2.257	41.707	20.087	•	-33.273	17.133	12.640
	5930.0	18.70	•	7.767	6.407	39.664	•	74.799	5.111	135.981	0.965	2.139	41.709	15.020	•	-44.207	15.080	10.929
	5940.0	17.38	•	7.765	6.397	39.433	•	74.541	5.127	145.841	0.964	2.017	41.711	10.023	•	-57.253	13.435	9.612
	5950.0	16.54	•	7.763	6.390	39.304	•	74.382	5.134	155.701	0.964	1.891	41.712	5.092	•	-72.545	12.346	8.773
	5960.0	16.23	•	7.762	6.385	39.277	•	74.317	5.134	165.561	0.963	1.763	41.712	0.227	•	-89.207	11.943	8.470
	5970.0	16.48	•	7.761	6.382	39.351	•	74.342	5.125	175.421	0.963	0.994	41.711	-4.576	•	-254.260	12.268	8.714
	5980.0	17.22	•	7.760	6.380	39.526	•	74.452	5.108	185.281	0.964	0.973	41.709	-9.322	•	-239.320	13.241	9.461
	5990.0	18.39	•	7.760	6.380	39.798	•	74.643	5.083	195.141	0.965	0.940	41.706	-14.016	•	-226.635	14.710	10.629
	6000.0	19.88	•	7.761	6.382	40.156	•	74.918	5.052	205.001	0.966	0.896	41.702	-18.664	•	-216.120	16.521	12.123
5877 0	5960.0	22.39	•	7.759	6.375	40.907	•	75.395	4.979	116.560	0.969	2.374	41.693	25.167	•	-24.192	19.437	14.630
	5970.0	20.37	•	7.754	6.356	40.483	•	74.914	5.007	126.420	0.966	2.260	41.697	20.037	•	-33.351	17.103	12.615
	5980.0	18.66	•	7.750	6.342	40.154	•	74.546	5.029	136.280	0.965	2.142	41.699	14.976	•	-44.293	15.55	10.908
	5990.0	17.34	•	7.748	6.332	39.922	•	74.285	5.045	146.140	0.963	2.019	41.701	9.983	•	-57.390	13.414	9.596
	6000.0	16.51	•	7.746	6.325	39.793	•	74.126	5.052	156.000	0.963	1.893	41.702	5.057	•	-72.655	12.330	8.762
	6010.0	16.21	•	7.745	6.320	39.766	•	74.061	5.052	165.860	0.962	1.765	41.702	0.195	•	-89.317	11.933	8.463
	6020.0	16.45	•	7.744	6.317	39.842	•	74.086	5.044	175.720	0.962	0.993	41.701	-4.606	•	-254.152	12.262	8.710
	6030.0	17.20	•	7.744	6.316	40.018	•	74.198	5.027	185.580	0.963	0.973	41.699	-9.351	•	-235.221	13.240	9.460
	6040.0	18.37	•	7.744	6.316	40.292	•	74.392	5.002	195.440	0.964	0.940	41.696	-14.044	•	-226.546	14.712	10.630
	6050.0	19.87	•	7.744	6.317	40.659	•	74.668	4.969	205.300	0.965	0.895	41.692	-18.692	•	-216.044	16.525	12.126
ECATE	TIME	CV	SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1		

TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
5927	6010.0	22.34	7.742	6.312	41.402	75.145	4.898	116.859	0.968	2.377	41.684	25.109	-24.265	19.403	14.600
317	6020.0	20.33	7.738	6.293	40.977	74.659	4.927	126.719	0.966	2.263	41.687	19.986	-33.433	17.073	12.589
	6030.0	18.62	7.734	6.279	40.646	74.288	4.949	136.579	0.964	2.144	41.690	14.930	-44.383	15.029	10.888
	6040.0	17.31	7.731	6.268	40.414	74.026	4.964	146.439	0.962	2.021	41.692	9.943	-57.451	13.354	9.580
	6050.0	16.48	7.730	6.261	40.284	73.865	4.972	156.299	0.962	1.895	41.693	5.021	-72.766	12.315	8.750
	6060.0	16.18	7.728	6.256	40.258	73.800	4.972	166.159	0.961	1.766	41.693	0.162	-89.433	11.923	8.456
	6070.0	16.43	7.728	6.253	40.335	73.826	4.963	176.019	0.962	0.993	41.691	-4.637	-254.039	12.257	8.706
	6080.0	17.19	7.727	6.252	40.513	73.940	4.946	185.879	0.962	0.973	41.689	-9.381	-235.118	13.239	9.459
	6090.0	18.36	7.727	6.253	40.789	74.137	4.921	195.739	0.963	0.940	41.687	-14.074	-226.454	14.714	10.632
	6100.0	19.86	7.727	6.255	41.159	74.416	4.889	205.599	0.965	0.895	41.683	-18.722	-215.962	16.530	12.131
5977	6060.0	22.30	7.727	6.250	41.898	74.891	4.819	117.158	0.967	2.380	41.675	25.049	-24.348	19.368	14.569
267	6070.0	20.29	7.722	6.231	41.472	74.400	4.847	127.018	0.965	2.266	41.678	19.933	-33.518	17.043	12.564
	6080.0	18.59	7.718	6.217	41.140	74.026	4.870	136.878	0.963	2.147	41.680	14.883	-44.477	15.004	10.867
	6090.0	17.28	7.718	6.206	40.907	73.761	4.885	146.738	0.962	2.024	41.682	9.900	-57.596	13.374	9.564
	6100.0	16.45	7.714	6.199	40.778	73.600	4.893	156.598	0.961	1.897	41.683	4.982	-72.883	12.300	8.739
	6110.0	16.16	7.712	6.194	40.752	73.535	4.893	166.458	0.960	1.768	41.683	0.127	-89.557	11.913	8.448
	6120.0	16.41	7.712	6.191	40.830	73.562	4.884	176.318	0.961	0.993	41.682	-4.670	-253.920	12.253	8.703
	6130.0	17.17	7.711	6.190	41.010	73.677	4.867	186.178	0.961	0.973	41.680	-9.413	-239.010	13.239	9.459
	6140.0	18.35	7.712	6.191	41.288	73.877	4.843	196.038	0.962	0.939	41.677	-14.106	-226.359	14.717	10.634
	6150.0	19.85	7.712	6.194	41.661	74.160	4.810	205.898	0.964	0.895	41.674	-18.755	-215.877	16.536	12.136
6027	6110.0	22.25	7.711	6.190	42.396	74.631	4.741	117.457	0.966	2.383	41.666	24.989	-24.429	19.332	14.538
217	6120.0	20.24	7.706	6.170	41.969	74.137	4.769	127.317	0.964	2.269	41.669	19.879	-33.606	17.012	12.538
	6130.0	18.55	7.703	6.156	41.636	73.759	4.792	137.177	0.962	2.149	41.671	14.835	-44.575	14.978	10.846
	6140.0	17.25	7.700	6.145	41.403	73.493	4.807	147.037	0.961	2.026	41.673	9.857	-57.707	13.353	9.548
	6150.0	16.43	7.698	6.138	41.273	73.330	4.815	156.897	0.960	1.899	41.674	4.943	-73.006	12.286	8.728
	6160.0	16.14	7.697	6.133	41.248	73.265	4.815	166.757	0.960	1.769	41.674	0.090	-89.684	11.904	8.442
	6170.0	16.40	7.696	6.130	41.327	73.293	4.807	176.617	0.960	0.993	41.673	-4.705	-253.797	12.249	8.700
	6180.0	17.16	7.696	6.130	41.509	73.410	4.790	186.477	0.960	0.973	41.671	-9.446	-238.898	13.239	9.459
	6190.0	18.33	7.697	6.131	41.790	73.613	4.765	196.337	0.962	0.939	41.668	-14.139	-226.259	14.722	10.638
	6200.0	19.84	7.697	6.134	42.166	73.900	4.732	206.197	0.963	0.894	41.665	-18.789	-215.789	16.543	12.142
6077	6160.0	22.20	7.696	6.131	42.896	74.368	4.664	117.757	0.966	2.386	41.657	24.928	-24.513	19.257	14.507
167	6170.0	20.20	7.692	6.111	42.468	73.868	4.693	127.617	0.963	2.272	41.660	19.824	-33.697	16.981	12.512
	6180.0	18.51	7.688	6.096	42.134	73.488	4.715	137.477	0.961	2.152	41.663	14.786	-44.677	14.952	10.825
	6190.0	17.22	7.685	6.085	41.901	73.219	4.731	147.336	0.960	2.028	41.664	9.812	-57.822	13.333	9.532
	6200.0	16.40	7.683	6.078	41.771	73.055	4.739	157.197	0.959	1.900	41.665	4.902	-73.134	12.271	8.716
	6210.0	16.12	7.682	6.073	41.747	72.990	4.739	167.057	0.959	1.771	41.665	0.052	-89.816	11.855	8.435
	6220.0	16.38	7.681	6.071	41.827	73.019	4.730	176.917	0.959	0.993	41.664	-4.741	-253.668	12.246	8.698
	6230.0	17.14	7.681	6.071	42.010	73.138	4.713	186.776	0.960	0.972	41.662	-9.481	-238.781	13.241	9.460
	6240.0	18.32	7.682	6.072	42.293	73.344	4.688	196.637	0.961	0.939	41.660	-14.174	-226.157	14.727	10.642
	6250.0	19.83	7.683	6.076	42.672	73.636	4.656	206.497	0.962	0.894	41.656	-18.824	-215.698	16.551	12.156
6127	6210.0	22.16	7.682	6.073	43.394	74.039	4.589	118.056	0.965	2.389	41.649	24.865	-24.599	19.261	14.475
117	6220.0	20.16	7.677	6.053	42.968	73.595	4.617	127.916	0.962	2.274	41.652	19.768	-33.791	16.950	12.485
	6230.0	18.48	7.673	6.038	42.634	73.211	4.640	137.776	0.961	2.154	41.654	14.735	-44.782	14.926	10.804
	6240.0	17.19	7.671	6.027	42.401	72.941	4.656	147.636	0.959	2.030	41.656	9.766	-57.942	13.312	9.516
	6250.0	16.37	7.669	6.020	42.271	72.776	4.664	157.496	0.958	1.902	41.657	4.859	-73.266	12.256	8.705
	6260.0	16.10	7.668	6.015	42.247	72.711	4.663	167.356	0.958	1.772	41.657	0.012	-89.955	11.887	8.429
	6270.0	16.36	7.667	6.013	42.328	72.741	4.655	177.216	0.958	0.993	41.656	-4.778	-253.535	12.243	8.696
	6280.0	17.13	7.667	6.013	42.513	72.862	4.638	187.076	0.959	0.972	41.654	-9.518	-238.661	13.243	9.462
	6290.0	18.31	7.668	6.015	42.799	73.071	4.613	196.936	0.960	0.938	41.651	-14.210	-226.051	14.732	10.646
	6300.0	19.82	7.669	6.019	43.181	73.367	4.581	206.796	0.962	0.893	41.648	-18.862	-215.605	16.560	12.156
ECATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

ECATE	TTIME	CV	SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
6177	6200.0	22.11	*	7.668	6.017	43.901	73.825	4.514	118.355	0.964	2.392	41.640	24.802	-24.688	19.225	14.444
67	6270.0	20.12	*	7.663	5.997	43.471	73.317	4.543	128.215	0.962	2.277	41.644	19.710	-33.888	16.919	12.459
	6240.0	18.44	*	7.659	5.981	43.136	72.930	4.566	138.075	0.960	2.156	41.646	14.683	-44.892	14.900	10.783
	6290.0	17.16	*	7.657	5.970	42.902	72.657	4.582	147.935	0.958	2.031	41.648	9.718	-58.066	13.252	9.500
	6300.0	16.35	*	7.655	5.963	42.773	72.492	4.590	157.795	0.958	1.903	41.649	4.816	-73.404	12.241	8.694
	6310.0	16.06	*	7.654	5.958	42.750	72.427	4.589	167.655	0.957	1.000	41.649	-0.024	269.898	11.879	8.423
	6320.0	16.35	*	7.653	5.956	42.832	72.458	4.581	177.515	0.957	0.993	41.648	-4.818	253.397	12.241	8.694
	6330.0	17.12	*	7.653	5.956	43.019	72.581	4.564	187.375	0.958	0.972	41.646	-9.556	238.536	13.245	9.464
	6340.0	18.31	*	7.654	5.959	43.307	72.793	4.539	197.235	0.959	0.938	41.643	-14.248	225.942	14.739	10.652
	6350.0	19.62	*	7.655	5.963	43.692	73.093	4.507	207.095	0.961	0.893	41.640	-18.901	215.505	16.570	12.164
6227	6310.0	22.07	*	7.655	5.962	44.406	73.546	4.441	118.654	0.964	2.395	41.633	24.737	-24.779	19.188	14.412
17	6320.0	20.04	*	7.650	5.942	43.975	73.034	4.470	128.514	0.961	2.279	41.636	19.652	-33.968	16.887	12.432
	6330.0	18.41	*	7.646	5.926	43.640	72.644	4.493	138.374	0.959	2.158	41.638	14.629	-45.005	14.874	10.761
	6340.0	17.13	*	7.643	5.915	43.406	72.369	4.509	148.234	0.958	2.033	41.640	9.670	-58.195	13.271	9.484
	6350.0	16.32	*	7.641	5.907	43.277	72.203	4.517	158.094	0.957	1.905	41.641	4.770	-73.547	12.227	8.684
	6360.0	16.06	*	7.640	5.903	43.254	72.138	4.517	167.954	0.956	1.000	41.641	-0.071	269.751	11.871	8.417
	6370.0	16.33	*	7.640	5.901	43.338	72.170	4.508	177.814	0.957	0.993	41.640	-4.858	253.254	12.239	8.693
	6380.0	17.11	*	7.640	5.901	43.527	72.295	4.491	187.674	0.957	0.972	41.638	-9.595	238.408	13.249	9.467
	6390.0	18.30	*	7.640	5.904	43.817	72.510	4.467	197.534	0.959	0.938	41.635	-14.288	225.830	14.747	10.658
	6400.0	19.62	*	7.642	5.909	44.205	72.814	4.434	207.394	0.960	0.892	41.632	-18.941	215.411	16.561	12.174
6277	6350.0	24.24	*	7.648	5.935	45.432	73.910	4.335	109.093	0.966	2.508	41.621	29.814	-17.040	21.644	16.588
33	6360.0	22.02	*	7.642	5.909	44.912	73.262	4.370	118.953	0.963	2.398	41.625	24.672	-24.872	19.152	14.380
	6370.0	20.04	*	7.636	5.888	44.481	72.745	4.399	128.813	0.960	2.282	41.628	19.592	-34.091	16.856	12.405
	6380.0	18.37	*	7.633	5.872	44.145	72.352	4.422	138.673	0.958	2.160	41.630	14.575	-45.121	14.847	10.739
	6390.0	17.10	*	7.630	5.860	43.911	72.076	4.437	148.533	0.957	2.035	41.632	9.620	-58.328	13.250	9.468
	6400.0	16.30	*	7.628	5.853	43.782	71.909	4.445	158.393	0.956	1.906	41.633	4.724	-73.695	12.213	8.673
	6410.0	16.04	*	7.627	5.848	43.761	71.844	4.445	168.253	0.956	1.000	41.633	-0.115	269.597	11.863	8.411
	6420.0	16.32	*	7.627	5.846	43.846	71.877	4.437	178.113	0.956	0.993	41.632	-4.900	253.107	12.238	8.692
	6430.0	17.10	*	7.627	5.847	44.036	72.004	4.420	187.973	0.957	0.971	41.630	-9.636	238.276	13.253	9.470
	6440.0	18.29	*	7.627	5.850	44.329	72.223	4.395	197.833	0.958	0.937	41.628	-14.329	225.714	14.755	10.665
6327	6400.0	24.19	*	7.635	5.883	45.940	73.626	4.264	109.392	0.966	2.512	41.614	29.741	-17.125	21.602	16.551
83	6410.0	21.98	*	7.629	5.856	45.420	72.972	4.299	119.252	0.962	2.401	41.618	24.606	-24.968	19.115	14.348
	6420.0	20.00	*	7.624	5.835	44.988	72.451	4.328	129.112	0.960	2.284	41.621	19.532	-34.197	16.824	12.378
	6430.0	18.34	*	7.620	5.819	44.652	72.055	4.351	138.972	0.958	2.162	41.623	14.520	-45.241	14.820	10.718
	6440.0	17.07	*	7.617	5.807	44.418	71.777	4.367	148.832	0.956	2.037	41.625	9.568	-58.465	13.229	9.452
	6450.0	16.28	*	7.615	5.800	44.290	71.609	4.375	158.692	0.955	1.908	41.626	4.676	-73.848	12.198	8.662
	6460.0	16.02	*	7.614	5.795	44.269	71.545	4.375	168.552	0.955	1.000	41.626	-0.160	269.439	11.856	8.406
	6470.0	16.31	*	7.614	5.794	44.356	71.579	4.366	178.412	0.955	0.992	41.625	-4.944	252.955	12.237	8.691
	6480.0	17.09	*	7.614	5.795	44.548	71.709	4.349	188.272	0.956	0.971	41.623	-9.679	238.140	13.258	9.474
	6490.0	18.29	*	7.615	5.798	44.843	71.930	4.324	198.132	0.957	0.937	41.620	-14.372	225.596	14.764	10.672
ECATE	TTIME	CV	SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1



TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
6061	6140.0	23.02	7.703	6.159	42.913	74.668	4.677	114.040	0.967	2.426	41.658	26.838	-21.480	20.212	15.312
183	6150.0	20.92	7.698	6.137	42.451	74.125	4.708	123.900	0.964	2.313	41.662	21.708	-30.112	17.814	13.222
	6160.0	19.10	7.694	6.120	42.082	73.703	4.733	133.760	0.962	2.195	41.665	16.644	-40.375	15.666	11.410
	6170.0	17.65	7.691	6.108	41.812	73.395	4.751	143.620	0.961	2.073	41.667	11.645	-52.656	13.878	9.961
	6180.0	16.65	7.689	6.100	41.644	73.194	4.762	153.480	0.960	1.947	41.668	6.711	-67.251	12.592	8.960
	6190.0	16.16	7.687	6.094	41.580	73.093	4.764	163.340	0.959	1.818	41.668	1.838	-83.579	11.952	8.477
	6200.0	16.23	7.686	6.091	41.622	73.088	4.759	173.200	0.959	0.997	41.668	-2.976	-255.647	12.037	8.541
	6210.0	16.81	7.686	6.090	41.767	73.174	4.745	183.060	0.960	0.982	41.666	-7.735	-244.036	12.810	9.127
	6220.0	17.85	7.686	6.091	42.013	73.347	4.723	192.920	0.961	0.953	41.664	-12.445	-230.559	14.133	10.164
	6230.0	19.25	7.687	6.093	42.357	73.606	4.693	202.780	0.962	0.912	41.660	-17.110	-219.335	15.848	11.561
6094	6170.0	23.61	7.696	6.129	43.441	74.723	4.613	110.622	0.967	2.468	41.651	28.693	-18.695	21.111	16.111
150	6180.0	21.63	7.690	6.105	42.947	74.130	4.646	120.482	0.965	2.357	41.655	23.543	-26.835	18.647	13.940
	6190.0	19.71	7.685	6.087	42.543	73.661	4.673	130.342	0.962	2.241	41.658	18.459	-36.457	16.359	12.021
	6200.0	18.11	7.682	6.073	42.235	73.310	4.694	140.202	0.961	2.120	41.660	13.440	-47.968	14.467	10.432
	6210.0	16.94	7.679	6.063	42.029	73.069	4.708	150.062	0.959	1.995	41.662	8.485	-61.741	12.983	9.261
	6220.0	16.26	7.678	6.056	41.927	72.932	4.713	159.922	0.959	1.867	41.662	3.592	-77.537	12.096	8.585
	6230.0	16.13	7.677	6.052	41.931	72.893	4.711	169.782	0.959	1.000	41.662	-1.241	-265.656	11.917	8.451
	6240.0	16.53	7.676	6.050	42.039	72.947	4.700	179.642	0.959	0.989	41.661	-6.019	-245.463	12.453	8.854
	6250.0	17.41	7.676	6.051	42.250	73.090	4.681	189.502	0.960	0.965	41.659	-10.746	-235.158	13.556	9.738
	6260.0	18.69	7.677	6.053	42.560	73.320	4.654	199.362	0.961	0.928	41.656	-15.427	-223.143	15.187	11.016
6144	6220.0	23.76	7.682	6.072	43.944	74.456	4.536	111.922	0.967	2.471	41.643	28.625	-18.778	21.072	16.076
100	6230.0	21.59	7.676	6.048	43.449	73.858	4.571	120.782	0.964	2.360	41.647	23.482	-26.924	18.612	13.910
	6240.0	19.67	7.671	6.029	43.044	73.385	4.596	130.642	0.962	2.244	41.650	18.404	-36.555	16.369	11.996
	6250.0	18.08	7.666	6.015	42.736	73.032	4.614	140.502	0.960	2.122	41.652	13.390	-48.055	14.443	10.413
	6260.0	16.91	7.665	6.005	42.530	72.789	4.633	150.362	0.959	1.997	41.653	8.439	-61.866	12.964	9.246
	6270.0	16.24	7.662	5.998	42.428	72.651	4.634	160.222	0.958	1.868	41.654	3.550	-77.675	12.083	8.575
	6280.0	16.11	7.663	5.994	42.433	72.612	4.636	170.082	0.958	0.999	41.654	-1.281	-265.516	11.910	8.446
	6290.0	16.52	7.662	5.993	42.542	72.667	4.625	179.942	0.958	0.989	41.653	-6.057	-245.331	12.451	8.853
	6300.0	17.40	7.662	5.993	42.755	72.813	4.607	189.802	0.959	0.964	41.651	-10.783	-235.040	13.559	9.741
	6310.0	18.68	7.662	5.996	43.068	73.046	4.580	199.662	0.960	0.927	41.648	-15.464	-223.040	15.194	11.022
6194	6270.0	23.71	7.665	6.017	44.449	74.185	4.464	111.721	0.966	2.475	41.635	28.556	-18.864	21.032	16.041
50	6280.0	21.54	7.660	5.992	43.953	73.681	4.497	121.081	0.963	2.363	41.639	23.420	-27.015	18.577	13.880
	6290.0	19.63	7.657	5.973	43.547	73.104	4.525	130.941	0.961	2.246	41.642	18.347	-36.656	16.339	11.971
	6300.0	18.05	7.654	5.959	43.238	72.748	4.545	140.801	0.959	2.124	41.644	13.339	-48.213	14.418	10.393
	6310.0	16.88	7.651	5.949	43.032	72.504	4.559	150.661	0.958	1.998	41.645	8.392	-61.996	12.945	9.231
	6320.0	16.21	7.650	5.942	42.931	72.365	4.565	160.521	0.957	1.869	41.646	3.506	-77.817	12.070	8.565
	6330.0	16.09	7.649	5.938	42.936	72.327	4.563	170.381	0.957	0.999	41.646	-1.322	-265.371	11.903	8.441
	6340.0	16.50	7.648	5.937	43.047	72.383	4.552	180.241	0.957	0.988	41.645	-6.096	-245.194	12.451	8.853
	6350.0	17.37	7.644	5.938	43.262	72.531	4.533	190.101	0.958	0.964	41.642	-10.821	-234.918	13.603	9.744
	6360.0	18.68	7.644	5.941	43.577	72.767	4.506	199.961	0.960	0.927	41.640	-15.503	-222.934	15.201	11.028
6244	6320.0	23.66	7.655	5.967	44.955	73.908	4.392	111.520	0.966	2.478	41.627	28.487	-18.951	20.952	16.005
C	6330.0	21.50	7.649	5.937	44.458	73.299	4.425	121.380	0.963	2.366	41.631	23.357	-27.109	18.542	13.849
	6340.0	19.59	7.644	5.918	44.051	72.818	4.452	131.240	0.960	2.248	41.634	18.290	-36.760	16.309	11.945
	6350.0	18.01	7.640	5.904	43.742	72.459	4.473	141.100	0.956	2.126	41.636	13.286	-48.332	14.353	10.372
	6360.0	16.85	7.638	5.893	43.536	72.213	4.487	150.960	0.957	2.000	41.637	8.344	-62.131	12.926	9.216
	6370.0	16.19	7.636	5.887	43.436	72.074	4.493	160.820	0.956	1.871	41.638	3.462	-77.965	12.057	8.556
	6380.0	16.07	7.635	5.883	43.442	72.036	4.490	170.680	0.956	0.999	41.638	-1.364	-265.221	11.897	8.437
	6390.0	16.49	7.635	5.882	43.554	72.094	4.482	180.540	0.957	0.988	41.637	-6.137	-245.053	12.451	8.853
	6400.0	17.38	7.635	5.883	43.771	72.244	4.461	190.400	0.958	0.964	41.635	-10.861	-234.793	13.608	9.748
	6410.0	18.67	7.636	5.886	44.089	72.484	4.434	200.260	0.959	0.927	41.632	-15.543	-222.824	15.210	11.036
ECATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

ECATE	TIME	CV	SUM	CV2	VINF2	PHI2	ALPHA2	VFL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
6294	6370.0	23.61	*	7.642	5.809	45.462	73.626	4.320	111.819	0.965	2.481	41.620	28.416	-19.040	20.952	15.969
317	6370.0	21.45	*	7.634	5.804	44.964	73.012	4.453	121.679	0.962	2.368	41.623	23.293	-27.206	18.506	13.818
	6370.0	17.55	*	7.631	5.864	44.553	72.527	4.381	131.533	0.960	2.251	41.626	18.231	-36.868	16.278	11.920
	6400.0	17.94	*	7.627	5.850	44.248	72.165	4.402	141.397	0.958	2.128	41.628	13.233	-48.454	14.368	10.352
	6410.0	16.63	*	7.627	5.834	44.042	71.918	4.416	151.239	0.956	2.002	41.630	8.295	-62.270	12.907	9.202
	6410.0	15.17	*	7.627	5.833	43.947	71.778	4.421	161.114	0.956	1.872	41.630	3.415	-78.117	12.045	8.546
	6410.0	10.05	*	7.622	5.827	43.944	71.741	4.419	170.974	0.956	0.999	41.630	-1.408	-265.066	11.852	8.432
	6440.0	10.43	*	7.622	5.828	44.063	71.800	4.408	181.834	0.956	0.988	41.629	-6.179	-248.908	12.451	8.853
	6410.0	17.37	*	7.622	5.830	44.242	71.952	4.389	191.694	0.957	0.963	41.627	-10.903	-234.664	13.614	9.753
	6410.0	16.67	*	7.627	5.833	44.602	72.195	4.362	201.559	0.958	0.926	41.624	-15.585	-222.712	15.220	11.043
6344	6410.0	23.56	*	7.627	5.858	45.970	73.339	4.250	112.118	0.964	2.484	41.613	28.345	-19.131	20.912	15.933
267	6430.0	21.41	*	7.622	5.832	45.473	72.719	4.283	121.978	0.961	2.371	41.616	23.228	-27.304	18.471	13.788
	6430.0	19.51	*	7.619	5.812	45.055	72.231	4.311	131.838	0.959	2.253	41.619	18.172	-36.978	16.748	11.894
	6410.0	17.94	*	7.619	5.797	44.756	71.866	4.332	141.698	0.957	2.130	41.621	13.178	-48.580	14.342	10.332
	6410.0	16.63	*	7.617	5.787	44.550	71.617	4.346	151.558	0.956	2.003	41.622	8.244	-62.413	12.887	9.187
	6470.0	16.15	*	7.611	5.780	44.457	71.477	4.351	161.418	0.955	1.873	41.623	3.368	-78.274	12.032	8.537
	6410.0	16.04	*	7.610	5.775	44.459	71.440	4.349	171.278	0.955	0.999	41.623	-1.453	-264.906	11.886	8.428
	6410.0	10.46	*	7.610	5.776	44.574	71.500	4.338	181.138	0.955	0.988	41.622	-6.223	-248.758	12.452	8.854
	6510.0	17.37	*	7.610	5.777	44.745	71.655	4.319	191.998	0.956	0.963	41.620	-10.946	-234.532	13.620	9.757
	6510.0	18.05	*	7.611	5.782	45.117	71.902	4.292	201.858	0.958	0.926	41.617	-15.628	-222.597	15.230	11.052
6394	6470.0	23.51	*	7.617	5.807	45.440	73.046	4.180	112.417	0.964	2.487	41.606	28.273	-19.224	20.871	15.897
217	6410.0	21.37	*	7.611	5.781	45.982	72.421	4.214	122.277	0.961	2.374	41.609	23.161	-27.405	18.435	13.756
	6410.0	17.47	*	7.608	5.761	45.575	71.928	4.242	132.137	0.958	2.255	41.612	18.111	-37.091	16.217	11.868
	6510.0	17.91	*	7.603	5.746	45.265	71.561	4.263	141.997	0.956	2.132	41.614	13.122	-48.709	14.317	10.311
	6510.0	16.77	*	7.600	5.735	45.060	71.311	4.277	151.857	0.955	2.005	41.615	8.192	-62.561	12.868	9.172
	6510.0	16.13	*	7.594	5.728	44.961	71.170	4.283	161.717	0.954	1.874	41.616	3.319	-78.436	12.020	8.528
	6510.0	16.02	*	7.594	5.725	44.970	71.134	4.280	171.577	0.954	0.999	41.616	-1.499	-264.742	11.881	8.425
	6510.0	10.45	*	7.597	5.724	45.087	71.195	4.269	181.437	0.955	0.988	41.615	-6.268	-248.605	12.454	8.855
	6510.0	17.36	*	7.597	5.726	45.339	71.353	4.250	191.297	0.956	0.963	41.613	-10.990	-234.396	13.627	9.763
	6510.0	18.05	*	7.595	5.731	45.634	71.603	4.223	201.157	0.957	0.925	41.610	-15.673	-222.479	15.241	11.061
6444	6510.0	23.47	*	7.605	5.757	46.938	72.744	4.112	112.716	0.963	2.489	41.599	28.201	-19.317	20.831	15.861
167	6510.0	21.32	*	7.595	5.731	46.493	72.117	4.146	122.577	0.960	2.376	41.602	23.094	-27.509	18.358	13.725
	6540.0	17.44	*	7.594	5.711	46.085	71.621	4.174	132.437	0.958	2.257	41.605	18.050	-37.207	16.185	11.842
	6510.0	17.04	*	7.591	5.696	45.776	71.251	4.195	142.297	0.956	2.134	41.607	13.065	-48.842	14.291	10.291
	6510.0	16.75	*	7.588	5.685	45.571	70.999	4.209	152.156	0.954	2.006	41.608	8.139	-62.713	12.849	9.157
	6510.0	16.11	*	7.587	5.678	45.472	70.858	4.215	162.017	0.954	1.876	41.609	3.269	-78.603	12.008	8.519
	6510.0	16.01	*	7.586	5.675	45.483	70.822	4.212	171.877	0.954	0.999	41.609	-1.547	-264.573	11.877	8.421
	6510.0	16.44	*	7.584	5.674	45.601	70.885	4.202	181.737	0.954	0.988	41.608	-6.314	-248.447	12.456	8.857
	6610.0	17.36	*	7.586	5.677	45.826	71.045	4.183	191.596	0.955	0.962	41.606	-11.036	-234.257	13.634	9.769
	6610.0	18.05	*	7.587	5.682	46.153	71.299	4.155	201.456	0.956	0.925	41.603	-15.719	-222.359	15.253	11.071
6494	6510.0	23.42	*	7.594	5.709	47.599	72.447	4.045	111.016	0.963	2.492	41.592	28.126	-19.415	20.789	15.825
117	6510.0	21.28	*	7.588	5.683	47.005	71.807	4.079	122.876	0.960	2.378	41.596	23.027	-27.615	18.362	13.694
	6510.0	19.40	*	7.583	5.662	46.598	71.307	4.107	132.736	0.957	2.259	41.598	17.987	-37.326	16.154	11.816
	6610.0	17.85	*	7.575	5.647	46.287	70.935	4.128	142.596	0.955	2.135	41.600	13.007	-48.979	14.266	10.270
	6610.0	16.72	*	7.577	5.636	46.083	70.682	4.142	152.456	0.954	2.007	41.602	8.085	-62.869	12.830	9.143
	6610.0	16.09	*	7.575	5.629	45.986	70.540	4.148	162.316	0.953	1.877	41.602	3.218	-78.774	11.956	8.510
	6630.0	15.99	*	7.574	5.626	45.997	70.505	4.146	172.176	0.953	0.999	41.602	-1.596	-264.399	11.873	8.418
	6640.0	16.43	*	7.574	5.625	46.117	70.570	4.135	182.036	0.953	0.987	41.601	-6.362	-248.286	12.459	8.859
	6610.0	17.35	*	7.575	5.628	46.344	70.732	4.116	191.896	0.954	0.962	41.599	-11.083	-234.115	13.643	9.775
	6610.0	18.06	*	7.576	5.634	46.673	70.989	4.089	201.756	0.956	0.924	41.596	-15.766	-222.236	15.266	11.081
ECATE	TIME	CV	SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	CV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	HFTA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
6544	6620.0	23.37	7.583	5.662	48.021	72.130	3.979	113.315	0.962	2.495	41.586	28.052	-19.513	20.748	15.788
67	6630.0	21.24	7.577	5.635	47.519	71.491	4.013	123.175	0.959	2.381	41.589	22.958	-27.723	18.325	13.662
	6640.0	19.36	7.572	5.614	47.111	70.988	4.041	133.035	0.957	2.261	41.592	17.923	-37.448	16.123	11.790
	6650.0	17.82	7.566	5.599	46.802	70.613	4.063	142.895	0.955	2.137	41.594	12.948	-49.119	14.240	10.250
	6660.0	16.69	7.561	5.588	46.598	70.357	4.077	152.755	0.953	2.009	41.595	8.029	-63.030	12.811	9.128
	6670.0	16.07	7.564	5.581	46.501	70.217	4.082	162.615	0.952	1.878	41.596	3.166	-78.950	11.984	8.502
	6680.0	15.94	7.562	5.578	46.513	70.182	4.080	172.475	0.952	0.999	41.596	-1.646	-264.221	11.869	8.415
	6690.0	15.42	7.562	5.578	46.635	70.248	4.069	182.335	0.953	0.987	41.595	-6.411	-248.120	12.462	8.861
	6700.0	17.31	7.564	5.581	46.863	70.413	4.050	192.195	0.954	0.962	41.593	-11.132	-233.969	13.652	9.782
	6710.0	16.66	7.564	5.587	47.195	70.674	4.023	202.055	0.955	0.924	41.590	-15.815	-222.111	15.279	11.092
6594	6610.0	23.32	7.577	5.616	48.534	71.814	3.914	113.614	0.962	2.498	41.580	27.976	-19.614	20.707	15.751
17	6620.0	21.20	7.566	5.588	48.040	71.165	3.948	123.474	0.959	2.383	41.583	22.889	-27.831	18.289	13.631
	6630.0	19.32	7.561	5.568	47.621	70.662	3.977	133.334	0.956	2.263	41.586	17.859	-37.573	16.041	11.763
	6700.0	17.72	7.557	5.552	47.317	70.265	3.998	143.194	0.954	2.139	41.588	12.888	-49.263	14.214	10.229
	6710.0	16.67	7.557	5.541	47.113	70.029	4.012	153.054	0.953	2.010	41.589	7.973	-63.194	12.791	9.113
	6720.0	16.05	7.557	5.534	47.017	69.887	4.018	162.914	0.952	1.878	41.590	3.112	-79.130	11.973	8.493
	6730.0	15.97	7.553	5.531	47.031	69.853	4.015	172.774	0.952	0.999	41.589	-1.698	-264.039	11.865	8.413
	6740.0	16.42	7.553	5.531	47.154	69.921	4.005	182.634	0.952	0.987	41.588	-6.461	-247.951	12.466	8.864
	6750.0	17.34	7.553	5.534	47.334	70.068	3.983	192.494	0.953	0.961	41.586	-11.182	-233.821	13.661	9.790
	6760.0	16.66	7.555	5.541	47.718	70.353	3.958	202.354	0.955	0.923	41.584	-15.865	-221.983	15.293	11.104
6644	6720.0	23.22	7.562	5.571	49.042	71.491	3.851	113.913	0.961	2.500	41.574	27.900	-19.716	20.665	15.714
33	6730.0	21.10	7.557	5.543	48.554	70.838	3.884	123.773	0.958	2.385	41.577	22.818	-27.944	18.252	13.599
	6740.0	19.22	7.551	5.522	48.142	70.331	3.913	133.633	0.955	2.265	41.580	17.793	-37.700	16.059	11.737
	6750.0	17.75	7.547	5.506	47.834	69.951	3.935	143.493	0.953	2.140	41.582	12.826	-49.410	14.188	10.208
	6760.0	16.64	7.544	5.495	47.630	69.694	3.949	153.353	0.952	2.011	41.583	7.915	-63.363	12.772	9.098
	6770.0	16.03	7.543	5.488	47.535	69.552	3.954	163.213	0.951	1.879	41.583	3.057	-79.315	11.962	8.484
	6780.0	15.95	7.542	5.485	47.550	69.518	3.952	173.073	0.951	0.999	41.583	-1.750	-263.853	11.862	8.410
	6790.0	16.41	7.542	5.485	47.675	69.584	3.941	182.933	0.952	0.987	41.582	-6.512	-247.778	12.470	8.867
	6800.0	17.34	7.542	5.489	47.957	69.754	3.922	192.793	0.953	0.961	41.580	-11.233	-233.669	13.671	9.798
	6810.0	16.66	7.542	5.496	48.243	70.026	3.894	202.653	0.954	0.923	41.578	-15.917	-221.852	15.308	11.116
6694	6720.0	23.23	7.552	5.527	49.564	71.162	3.788	114.212	0.961	2.503	41.568	27.823	-19.820	20.623	15.676
83	6730.0	21.11	7.545	5.499	49.071	70.504	3.822	124.072	0.958	2.388	41.571	22.747	-28.059	18.215	13.566
	6740.0	19.23	7.540	5.473	48.657	69.993	3.851	133.932	0.955	2.267	41.574	17.727	-37.831	16.027	11.710
	6750.0	17.72	7.537	5.461	48.351	69.611	3.872	143.792	0.953	2.142	41.576	12.764	-49.561	14.161	10.187
	6760.0	16.62	7.534	5.450	48.149	69.353	3.886	153.652	0.951	2.012	41.577	7.857	-63.535	12.753	9.084
	6770.0	16.01	7.533	5.443	48.054	69.210	3.892	163.512	0.951	1.880	41.578	3.001	-79.503	11.950	8.476
	6780.0	15.94	7.532	5.440	48.071	69.177	3.889	173.372	0.951	0.999	41.577	-1.804	-263.662	11.859	8.408
	6790.0	16.41	7.532	5.441	48.197	69.242	3.878	183.232	0.951	0.987	41.576	-6.565	-247.602	12.475	8.871
	6800.0	17.34	7.532	5.445	48.431	69.421	3.859	193.092	0.952	0.961	41.575	-11.285	-233.515	13.682	9.807
	6810.0	16.66	7.532	5.452	48.769	69.694	3.832	202.952	0.954	0.922	41.572	-15.970	-221.719	15.323	11.128
ECATE	TTIME	LV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	HFTA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

ECATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
6428	6510.0	22.10	7.605	5.756	46.499	72.431	4.156	118.860	0.962	2.418	41.603	24.984	-24.317	19.282	14.494
183	6520.0	20.11	7.600	5.734	46.057	71.888	4.186	128.720	0.959	2.301	41.606	19.915	-33.409	16.978	12.508
	6530.0	18.42	7.596	5.717	45.711	71.474	4.210	138.580	0.957	2.179	41.609	14.907	-44.280	14.951	10.824
	6540.0	17.12	7.593	5.705	45.467	71.181	4.227	148.440	0.955	2.053	41.610	9.958	-57.311	13.323	9.525
	6550.0	16.29	7.591	5.696	45.329	71.000	4.236	158.300	0.954	1.923	41.611	5.067	-72.531	12.243	8.696
	6560.0	15.93	7.590	5.692	45.299	70.926	4.236	168.160	0.954	1.791	41.611	0.231	-89.190	11.842	8.395
	6570.0	16.23	7.585	5.690	45.177	70.953	4.229	178.020	0.954	0.994	41.610	-4.554	-254.242	12.166	8.638
	6580.0	16.97	7.590	5.692	45.562	71.077	4.213	187.880	0.955	0.973	41.609	-9.293	-235.248	13.140	9.382
	6590.0	18.14	7.591	5.696	45.852	71.295	4.182	197.740	0.956	0.940	41.606	-13.989	-226.509	14.614	10.551
	6600.0	19.64	7.592	5.702	46.241	71.607	4.156	207.600	0.958	0.895	41.603	-18.650	-215.951	16.434	12.051
6462	6540.0	22.06	7.600	5.733	47.028	72.460	4.098	115.442	0.962	2.461	41.597	26.811	-21.407	20.153	15.260
150	6550.0	20.78	7.594	5.708	46.553	71.865	4.131	125.302	0.959	2.346	41.601	21.724	-29.961	17.773	13.186
	6560.0	18.97	7.585	5.689	46.171	71.402	4.157	135.162	0.957	2.225	41.603	16.697	-40.138	15.625	11.385
	6570.0	17.52	7.586	5.675	45.889	71.064	4.176	145.022	0.955	2.101	41.605	11.730	-52.358	13.849	9.939
	6580.0	16.52	7.584	5.666	45.712	70.842	4.188	154.882	0.954	1.972	41.606	6.820	-66.825	12.555	8.932
	6590.0	16.02	7.582	5.660	45.642	70.729	4.192	164.742	0.953	1.841	41.607	1.966	-83.110	11.898	8.437
	6600.0	16.97	7.582	5.657	45.682	70.720	4.187	174.602	0.953	0.997	41.606	-2.836	-260.092	11.964	8.486
	6610.0	16.64	7.582	5.658	45.829	70.810	4.174	184.462	0.954	0.982	41.605	-7.590	-244.401	12.719	9.057
	6620.0	17.67	7.583	5.661	46.082	70.996	4.153	194.322	0.955	0.954	41.603	-12.301	-230.825	14.032	10.083
	6630.0	19.06	7.584	5.667	46.437	71.276	4.124	204.182	0.957	0.913	41.600	-16.975	-219.516	15.743	11.475
6512	6590.0	22.81	7.588	5.685	47.546	72.149	4.031	115.742	0.962	2.463	41.591	26.739	-21.505	20.113	15.225
100	6600.0	20.74	7.582	5.660	47.065	71.552	4.064	125.602	0.959	2.348	41.594	21.657	-30.070	17.730	13.156
	6610.0	18.94	7.578	5.641	46.683	71.086	4.091	135.462	0.956	2.227	41.597	16.635	-40.262	15.605	11.361
	6620.0	17.49	7.575	5.626	46.407	70.745	4.110	145.322	0.955	2.102	41.599	11.672	-52.501	13.825	9.919
	6630.0	16.49	7.572	5.617	46.225	70.522	4.122	155.182	0.953	1.973	41.600	6.766	-66.988	12.538	8.919
	6640.0	16.00	7.571	5.611	46.157	70.409	4.125	165.042	0.953	1.842	41.600	1.915	-83.285	11.888	8.430
	6650.0	16.05	7.570	5.608	46.197	70.401	4.121	174.902	0.953	0.997	41.600	-2.885	-259.915	11.961	8.484
	6660.0	16.63	7.571	5.609	46.347	70.493	4.108	184.762	0.953	0.982	41.598	-7.638	-244.243	12.723	9.061
	6670.0	17.66	7.571	5.613	46.602	70.681	4.086	194.622	0.955	0.953	41.596	-12.349	-230.687	14.041	10.091
	6680.0	19.06	7.573	5.619	46.959	70.966	4.057	204.482	0.956	0.912	41.593	-17.023	-215.397	15.757	11.486
6562	6640.0	22.77	7.577	5.638	48.059	71.835	3.966	116.041	0.961	2.466	41.585	26.666	-21.606	20.073	15.190
50	6650.0	20.70	7.571	5.613	47.579	71.233	3.999	125.901	0.958	2.350	41.588	21.590	-30.182	17.702	13.126
	6660.0	18.90	7.567	5.593	47.197	70.763	4.025	135.761	0.956	2.229	41.590	16.573	-40.390	15.575	11.336
	6670.0	17.46	7.564	5.579	46.916	70.421	4.045	145.621	0.954	2.104	41.592	11.614	-52.648	13.801	9.900
	6680.0	16.47	7.561	5.569	46.740	70.197	4.056	155.481	0.953	1.975	41.593	6.711	-67.154	12.520	8.906
	6690.0	15.98	7.560	5.563	46.673	70.084	4.060	165.341	0.952	1.843	41.594	1.863	-83.464	11.879	8.423
	6700.0	16.04	7.559	5.561	46.714	70.077	4.055	175.201	0.952	0.997	41.593	-2.935	-259.741	11.960	8.483
	6710.0	16.62	7.560	5.562	46.865	70.170	4.042	185.061	0.953	0.982	41.592	-7.687	-244.081	12.728	9.065
	6720.0	17.66	7.561	5.566	47.122	70.361	4.021	194.921	0.954	0.953	41.590	-12.398	-230.546	14.052	10.100
	6730.0	19.06	7.562	5.573	47.482	70.650	3.992	204.781	0.956	0.912	41.587	-17.072	-219.275	15.772	11.498
6612	6690.0	22.72	7.567	5.592	48.572	71.516	3.902	116.340	0.961	2.469	41.578	26.592	-21.710	20.033	15.154
0	6700.0	20.66	7.561	5.567	48.094	70.908	3.935	126.200	0.958	2.352	41.582	21.521	-30.297	17.667	13.095
	6710.0	18.87	7.556	5.547	47.713	70.435	3.961	136.060	0.955	2.231	41.584	16.509	-40.520	15.545	11.311
	6720.0	17.43	7.553	5.532	47.432	70.090	3.980	145.920	0.953	2.105	41.586	11.554	-52.798	13.716	9.881
	6730.0	16.44	7.551	5.523	47.256	69.865	3.992	155.780	0.952	1.976	41.587	6.655	-67.326	12.503	8.893
	6740.0	15.97	7.545	5.517	47.190	69.752	3.996	165.640	0.952	1.843	41.587	1.809	-83.648	11.869	8.416
	6750.0	16.03	7.545	5.514	47.233	69.746	3.991	175.500	0.952	0.997	41.587	-2.987	-259.560	11.958	8.482
	6760.0	16.62	7.545	5.516	47.385	69.841	3.978	185.360	0.952	0.981	41.586	-7.738	-243.916	12.734	9.069
	6770.0	17.66	7.550	5.520	47.644	70.036	3.957	195.220	0.953	0.952	41.584	-12.448	-230.402	14.63	10.108
	6780.0	19.06	7.552	5.527	48.006	70.328	3.927	205.080	0.955	0.911	41.581	-17.123	-219.151	15.787	11.511
ECATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

FCATF	TTIME	CV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
6662	6710.0	22.67	7.556	5.548	49.067	71.189	3.838	116.639	0.960	2.471	41.573	26.516	-21.815	19.992	15.118
317	6720.0	20.62	7.550	5.521	48.616	70.573	3.870	126.499	0.957	2.355	41.576	21.452	-30.412	17.631	13.065
	6730.0	18.83	7.546	5.502	48.229	70.100	3.898	136.359	0.955	2.233	41.578	16.444	-40.653	15.514	11.285
	6740.0	17.40	7.543	5.487	47.949	69.754	3.917	146.219	0.953	2.107	41.580	11.494	-50.952	13.752	9.862
	6750.0	16.42	7.540	5.477	47.774	69.528	3.929	156.079	0.952	1.977	41.581	6.598	-67.501	12.486	8.880
	6760.0	15.95	7.539	5.471	47.708	69.415	3.933	166.939	0.951	1.844	41.581	1.755	-83.836	11.860	8.409
	6770.0	16.02	7.539	5.469	47.753	69.410	3.928	176.799	0.951	0.997	41.581	-3.040	-259.374	11.957	8.481
	6780.0	16.61	7.539	5.471	47.907	69.507	3.915	186.659	0.952	0.981	41.580	-7.789	-243.747	12.740	9.074
	6790.0	17.66	7.540	5.475	48.168	69.704	3.893	196.519	0.953	0.952	41.578	-12.500	-230.256	14.075	10.118
	6800.0	19.07	7.542	5.483	48.532	70.000	3.864	206.379	0.955	0.911	41.575	-17.176	-219.025	15.803	11.524
6712	6730.0	22.63	7.546	5.504	49.603	70.857	3.776	116.938	0.960	2.473	41.567	26.441	-21.922	19.951	15.082
267	6740.0	20.57	7.540	5.477	49.132	70.236	3.808	126.798	0.957	2.357	41.570	21.382	-30.531	17.595	13.034
	6750.0	18.60	7.536	5.458	48.747	69.760	3.836	136.658	0.954	2.235	41.572	16.379	-40.790	15.484	11.260
	6760.0	17.38	7.533	5.443	48.467	69.411	3.855	146.518	0.952	2.108	41.574	11.432	-53.110	13.728	9.842
	6770.0	16.40	7.530	5.433	48.293	69.184	3.867	156.378	0.951	1.978	41.575	6.540	-67.680	12.469	8.866
	6780.0	15.93	7.529	5.427	48.228	69.071	3.871	166.238	0.950	1.845	41.576	1.699	-84.029	11.851	8.402
	6790.0	16.01	7.529	5.425	48.274	69.067	3.866	176.098	0.950	0.997	41.575	-3.093	-255.185	11.957	8.481
	6800.0	16.61	7.529	5.426	48.430	69.166	3.853	186.958	0.951	0.981	41.574	-7.842	-243.575	12.747	9.079
	6810.0	17.66	7.530	5.431	48.693	69.366	3.831	196.818	0.952	0.952	41.572	-12.552	-230.106	14.087	10.128
	6820.0	19.07	7.532	5.440	49.059	69.666	3.801	206.678	0.954	0.910	41.569	-17.229	-218.897	15.820	11.538
6762	6740.0	22.50	7.537	5.462	50.120	70.517	3.715	117.237	0.959	2.476	41.561	26.364	-22.031	19.910	15.046
217	6750.0	20.53	7.531	5.435	49.649	69.892	3.747	127.097	0.956	2.359	41.564	21.311	-30.653	17.559	13.003
	6760.0	18.76	7.526	5.415	49.265	69.412	3.774	136.957	0.954	2.236	41.567	16.312	-40.925	15.553	11.235
	6770.0	17.33	7.523	5.399	48.985	69.061	3.794	146.817	0.952	2.109	41.569	11.370	-53.271	13.703	9.823
	6780.0	16.37	7.521	5.389	48.813	68.834	3.806	156.677	0.950	1.979	41.570	6.481	-67.864	12.452	8.854
	6790.0	15.92	7.519	5.384	48.750	68.721	3.809	166.537	0.950	1.846	41.570	1.643	-84.226	11.843	8.396
	6800.0	16.00	7.519	5.382	48.797	68.718	3.805	176.397	0.950	0.997	41.569	-3.148	-258.992	11.957	8.481
	6810.0	16.60	7.519	5.383	48.954	68.819	3.791	186.257	0.951	0.981	41.568	-7.897	-243.399	12.754	9.084
	6820.0	17.66	7.521	5.389	49.219	69.022	3.770	196.117	0.952	0.951	41.566	-12.606	-229.954	14.100	10.138
	6830.0	19.09	7.522	5.397	49.588	69.326	3.740	206.977	0.954	0.910	41.564	-17.284	-218.767	15.838	11.553
6812	6740.0	22.54	7.529	5.420	50.637	70.171	3.654	117.536	0.959	2.478	41.556	26.287	-22.142	19.869	15.009
167	6750.0	20.49	7.521	5.393	50.167	69.541	3.687	127.396	0.956	2.361	41.559	21.238	-30.777	17.522	12.972
	6760.0	18.73	7.517	5.372	49.791	69.054	3.713	137.257	0.953	2.238	41.561	16.246	-41.068	15.422	11.209
	6770.0	17.31	7.514	5.357	49.506	68.706	3.734	147.117	0.951	2.111	41.563	11.306	-53.436	13.678	9.804
	6780.0	16.33	7.511	5.347	49.334	68.477	3.746	156.977	0.950	1.980	41.564	6.420	-68.051	12.435	8.841
	6790.0	15.97	7.510	5.341	49.272	68.365	3.749	166.836	0.949	1.846	41.564	1.585	-84.426	11.834	8.390
	6800.0	15.99	7.510	5.340	49.321	68.362	3.744	176.697	0.949	0.997	41.564	-3.205	-258.794	11.957	8.481
	6810.0	16.60	7.510	5.342	49.480	68.466	3.731	186.557	0.950	0.980	41.563	-7.952	-243.221	12.762	9.090
	6820.0	17.66	7.511	5.347	49.747	68.672	3.709	196.417	0.951	0.951	41.561	-12.662	-229.800	14.114	10.149
	6830.0	19.09	7.513	5.356	50.118	68.980	3.679	206.276	0.953	0.909	41.558	-17.340	-218.634	15.856	11.568
6862	6740.0	22.49	7.518	5.379	51.155	69.817	3.595	117.836	0.958	2.480	41.551	26.209	-22.254	19.828	14.973
117	6750.0	20.45	7.512	5.352	50.686	69.184	3.628	127.696	0.955	2.362	41.554	21.165	-30.903	17.486	12.941
	6760.0	18.69	7.509	5.331	50.310	68.693	3.654	137.556	0.953	2.239	41.556	16.177	-41.213	15.351	11.184
	6770.0	17.27	7.504	5.316	50.028	68.343	3.674	147.416	0.951	2.112	41.558	11.242	-53.604	13.654	9.784
	6780.0	16.33	7.502	5.306	49.857	68.114	3.686	157.276	0.949	1.981	41.559	6.359	-68.242	12.418	8.828
	6790.0	15.88	7.501	5.300	49.796	68.002	3.690	167.136	0.949	1.847	41.559	1.526	-84.631	11.826	8.384
	6800.0	15.98	7.501	5.298	49.846	68.000	3.685	176.996	0.949	0.997	41.559	-3.262	-258.594	11.957	8.481
	6810.0	16.60	7.501	5.301	50.007	68.105	3.672	186.856	0.950	0.980	41.558	-8.008	-243.039	12.770	9.097
	6820.0	17.66	7.502	5.307	50.275	68.315	3.650	196.716	0.951	0.950	41.556	-12.718	-229.643	14.128	10.160
	6830.0	19.09	7.504	5.316	50.646	68.627	3.620	206.576	0.953	0.908	41.553	-17.397	-218.499	15.875	11.584
FCATF	TTIME	CV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

EDATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
6912	6990.0	22.45	7.510	5.340	51.674	69.457	3.536	118.135	0.958	2.482	41.546	26.130	-22.368	19.786	14.936
67	7000.0	20.41	7.504	5.312	51.205	68.819	3.569	127.995	0.955	2.364	41.549	21.092	-31.031	17.449	12.909
	7010.0	18.66	7.499	5.291	50.830	68.326	3.596	137.855	0.952	2.241	41.551	16.108	-41.361	15.359	11.158
	7020.0	17.26	7.496	5.276	50.550	67.973	3.616	147.715	0.950	2.113	41.553	11.176	-53.775	13.629	9.765
	7030.0	16.31	7.493	5.265	50.380	67.743	3.628	157.575	0.949	1.981	41.554	6.297	-68.437	12.401	8.815
	7040.0	15.87	7.492	5.260	50.320	67.632	3.632	167.435	0.948	1.847	41.554	1.466	-84.840	11.818	8.378
	7050.0	15.97	7.492	5.258	50.372	67.631	3.627	177.295	0.948	0.997	41.554	-3.320	-258.389	11.958	8.482
	7060.0	16.60	7.492	5.261	50.534	67.739	3.613	187.155	0.949	0.980	41.552	-8.066	-242.855	12.779	9.103
	7070.0	17.67	7.494	5.267	50.805	67.951	3.591	197.015	0.951	0.950	41.550	-12.776	-229.484	14.143	10.172
	7080.0	19.10	7.496	5.277	51.180	68.267	3.561	206.875	0.953	0.908	41.548	-17.455	-218.363	15.854	11.600
6962	7040.0	22.40	7.501	5.301	52.194	69.088	3.479	118.434	0.958	2.485	41.541	26.051	-22.484	19.744	14.900
17	7050.0	20.37	7.495	5.273	51.726	68.447	3.512	128.294	0.954	2.366	41.544	21.017	-31.161	17.412	12.878
	7060.0	18.62	7.490	5.252	51.351	67.952	3.539	138.154	0.952	2.242	41.546	16.038	-41.511	15.328	11.132
	7070.0	17.23	7.487	5.236	51.079	67.592	3.558	148.014	0.950	2.114	41.548	11.111	-53.947	13.604	9.745
	7080.0	16.29	7.485	5.226	50.904	67.366	3.571	157.874	0.948	1.982	41.549	6.233	-68.636	12.384	8.802
	7090.0	15.86	7.484	5.220	50.846	67.255	3.574	167.734	0.948	1.848	41.549	1.405	-85.053	11.810	8.372
	7100.0	15.97	7.483	5.219	50.899	67.256	3.569	177.594	0.948	0.996	41.549	-3.380	-258.181	11.960	8.483
	7110.0	16.59	7.484	5.222	51.063	67.365	3.556	187.454	0.949	0.979	41.547	-8.125	-242.667	12.788	9.110
	7120.0	17.67	7.485	5.228	51.335	67.580	3.534	197.314	0.950	0.949	41.546	-12.834	-229.322	14.158	10.185
	7130.0	19.10	7.488	5.239	51.712	67.900	3.503	207.174	0.952	0.907	41.543	-17.515	-218.224	15.814	11.617
7012	7040.0	22.36	7.493	5.263	52.714	68.713	3.422	118.733	0.957	2.487	41.536	25.971	-22.601	19.702	14.863
33	7100.0	20.33	7.487	5.235	52.247	68.067	3.455	128.593	0.954	2.368	41.539	20.942	-31.294	17.375	12.846
	7110.0	18.59	7.482	5.214	51.873	67.570	3.482	138.453	0.951	2.244	41.541	15.967	-41.664	15.256	11.106
	7120.0	17.20	7.479	5.198	51.602	67.209	3.502	148.313	0.949	2.115	41.543	11.044	-54.125	13.579	9.726
	7130.0	16.27	7.477	5.188	51.429	66.982	3.514	158.173	0.948	1.983	41.544	6.169	-68.839	12.367	8.789
	7140.0	15.84	7.475	5.182	51.372	66.871	3.518	168.033	0.947	1.848	41.544	1.343	-85.269	11.803	8.366
	7150.0	15.96	7.475	5.181	51.427	66.873	3.513	177.893	0.948	0.996	41.544	-3.440	-257.970	11.961	8.484
	7160.0	16.59	7.476	5.184	51.592	66.984	3.499	187.753	0.948	0.979	41.543	-8.184	-242.477	12.798	9.118
	7170.0	17.67	7.477	5.191	51.867	67.202	3.477	197.613	0.950	0.949	41.541	-12.894	-229.158	14.175	10.198
	7180.0	19.11	7.480	5.202	52.246	67.527	3.447	207.473	0.952	0.907	41.538	-17.575	-218.084	15.935	11.634
7062	7140.0	22.31	7.485	5.227	53.234	68.329	3.366	119.032	0.957	2.489	41.532	25.890	-22.720	19.660	14.826
83	7150.0	20.29	7.479	5.198	52.768	67.680	3.400	128.892	0.953	2.369	41.534	20.866	-31.428	17.337	12.814
	7160.0	18.55	7.474	5.176	52.396	67.180	3.427	138.752	0.951	2.245	41.537	15.895	-41.820	15.265	11.080
	7170.0	17.18	7.471	5.160	52.125	66.818	3.446	148.612	0.949	2.116	41.538	10.975	-54.307	13.555	9.706
	7180.0	16.25	7.469	5.150	51.962	66.585	3.458	158.472	0.948	1.983	41.539	6.105	-69.041	12.351	8.777
	7190.0	15.83	7.467	5.145	51.899	66.479	3.462	168.332	0.947	1.848	41.540	1.280	-85.489	11.796	8.361
	7200.0	15.95	7.467	5.143	51.955	66.483	3.457	178.192	0.947	0.996	41.539	-3.502	-257.755	11.964	8.486
	7210.0	16.59	7.468	5.147	52.123	66.596	3.443	188.052	0.948	0.979	41.538	-8.245	-242.283	12.808	9.126
	7220.0	17.68	7.469	5.154	52.399	66.817	3.421	197.912	0.949	0.948	41.536	-12.955	-228.951	14.151	10.211
	7230.0	19.12	7.472	5.165	52.780	67.146	3.391	207.772	0.951	0.906	41.534	-17.637	-217.942	15.957	11.652
EDATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

EDATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
6795	6870.0	23.36	7.532	5.445	50.663	70.553	3.660	113.820	0.960	2.519	41.557	28.180	-19.270	20.789	15.824
183	6880.0	21.23	7.527	5.416	50.160	69.870	3.695	123.680	0.957	2.404	41.560	23.109	-27.399	18.372	13.703
	6890.0	19.35	7.521	5.393	49.748	69.333	3.724	133.540	0.954	2.283	41.562	18.095	-37.026	16.169	11.828
	6900.0	17.30	7.518	5.376	49.426	68.937	3.747	143.400	0.952	2.157	41.564	13.134	-48.584	14.277	10.280
	6910.0	16.66	7.515	5.364	49.215	68.664	3.762	153.260	0.950	2.028	41.566	8.228	-62.378	12.830	9.143
	6920.0	16.01	7.513	5.357	49.111	68.510	3.768	163.120	0.950	1.895	41.566	3.373	-78.217	11.976	8.496
	6930.0	15.90	7.513	5.353	49.119	68.468	3.767	172.980	0.950	0.999	41.566	-1.433	-264.957	11.829	8.385
	6940.0	16.37	7.513	5.354	49.237	68.532	3.756	182.840	0.950	0.988	41.565	-6.196	-238.778	12.393	8.809
	6950.0	17.22	7.514	5.358	49.464	68.700	3.738	192.700	0.951	0.963	41.563	-10.919	-234.505	13.560	9.711
	6960.0	18.52	7.515	5.366	49.797	68.969	3.711	202.560	0.953	0.926	41.561	-15.608	-222.533	15.175	11.007
6829	6910.0	21.96	7.522	5.398	50.683	69.867	3.643	120.262	0.958	2.448	41.555	24.912	-24.340	19.212	14.433
150	6920.0	19.98	7.517	5.372	50.237	69.275	3.674	130.122	0.955	2.329	41.558	19.881	-33.379	16.924	12.463
	6930.0	18.30	7.513	5.353	49.888	68.822	3.699	139.982	0.952	2.205	41.560	14.904	-44.191	14.908	10.789
	6940.0	17.00	7.510	5.340	49.631	68.508	3.717	149.842	0.951	2.076	41.562	9.980	-57.167	13.285	9.495
	6950.0	16.17	7.507	5.331	49.488	68.311	3.727	159.702	0.950	1.945	41.562	5.109	-72.343	12.202	8.665
	6960.0	15.87	7.507	5.326	49.456	68.228	3.728	169.562	0.949	1.810	41.563	0.286	-88.990	11.754	8.360
	6970.0	16.10	7.507	5.325	49.535	68.255	3.721	179.422	0.949	0.994	41.562	-4.491	-254.411	12.110	8.595
	6980.0	16.84	7.507	5.328	49.723	68.386	3.705	189.282	0.950	0.974	41.561	-9.227	-239.364	13.078	9.334
	6990.0	18.01	7.509	5.335	50.019	68.621	3.681	199.142	0.952	0.941	41.558	-13.928	-226.568	14.550	10.499
	7000.0	19.31	7.511	5.345	50.417	68.958	3.649	209.002	0.954	0.896	41.556	-18.599	-215.960	16.374	12.000
6879	6960.0	21.91	7.514	5.358	51.202	69.509	3.584	120.562	0.957	2.450	41.550	24.835	-24.457	19.172	14.398
100	6970.0	19.94	7.508	5.332	50.756	68.914	3.615	130.422	0.954	2.331	41.553	19.809	-33.510	16.888	12.433
	6980.0	18.27	7.504	5.312	50.408	68.459	3.640	140.282	0.952	2.206	41.555	14.836	-44.343	14.878	10.765
	6990.0	16.97	7.501	5.299	50.153	68.143	3.658	150.142	0.950	2.078	41.556	9.916	-57.343	13.262	9.477
	7000.0	16.15	7.499	5.290	50.011	67.945	3.668	160.002	0.949	1.945	41.557	5.048	-72.541	12.187	8.654
	7010.0	15.85	7.498	5.285	49.980	67.863	3.669	169.862	0.949	1.811	41.557	0.228	-89.197	11.788	8.355
	7020.0	16.10	7.498	5.285	50.060	67.891	3.662	179.722	0.949	0.994	41.557	-4.548	-254.213	12.113	8.597
	7030.0	16.84	7.498	5.288	50.251	68.025	3.646	189.582	0.950	0.973	41.555	-9.284	-239.188	13.088	9.342
	7040.0	18.01	7.500	5.295	50.548	68.262	3.622	199.442	0.951	0.940	41.553	-13.985	-226.417	14.566	10.512
	7050.0	19.32	7.502	5.306	50.949	68.604	3.590	209.302	0.953	0.895	41.550	-18.657	-215.830	16.354	12.017
6929	7010.0	21.87	7.504	5.318	51.721	69.145	3.526	120.861	0.957	2.452	41.545	24.758	-24.574	19.131	14.362
50	7020.0	19.90	7.495	5.292	51.277	68.546	3.557	130.721	0.954	2.333	41.548	19.736	-33.644	16.853	12.403
	7030.0	18.24	7.495	5.272	50.928	68.089	3.582	140.581	0.951	2.208	41.550	14.768	-44.498	14.849	10.741
	7040.0	16.95	7.492	5.259	50.675	67.770	3.600	150.441	0.950	2.079	41.551	9.851	-57.522	13.239	9.459
	7050.0	16.13	7.490	5.250	50.535	67.572	3.610	160.301	0.949	1.946	41.552	4.986	-72.743	12.173	8.643
	7060.0	15.84	7.485	5.245	50.505	67.491	3.611	170.161	0.948	1.811	41.552	0.168	-89.408	11.783	8.351
	7070.0	16.09	7.485	5.245	50.587	67.520	3.604	180.021	0.948	0.993	41.552	-4.607	-254.012	12.116	8.600
	7080.0	16.84	7.490	5.248	50.779	67.656	3.588	189.881	0.949	0.973	41.550	-9.342	-239.009	13.099	9.350
	7090.0	18.02	7.491	5.256	51.079	67.897	3.564	199.741	0.951	0.940	41.548	-14.043	-226.263	14.583	10.525
	7100.0	19.33	7.494	5.267	51.481	68.243	3.532	209.601	0.953	0.894	41.545	-18.716	-215.658	16.415	12.035
6979	7060.0	21.82	7.497	5.280	52.241	68.773	3.468	121.160	0.956	2.454	41.540	24.680	-24.694	19.091	14.327
0	7070.0	19.86	7.491	5.254	51.797	68.170	3.500	131.020	0.953	2.334	41.543	19.662	-33.780	16.817	12.373
	7080.0	18.20	7.487	5.234	51.450	67.711	3.525	140.880	0.951	2.209	41.545	14.698	-44.656	14.819	10.716
	7090.0	16.93	7.483	5.219	51.206	67.386	3.542	150.740	0.949	2.080	41.546	9.786	-57.702	13.216	9.442
	7100.0	16.11	7.482	5.211	51.060	67.193	3.553	160.600	0.948	1.947	41.547	4.923	-72.948	12.158	8.632
	7110.0	15.83	7.481	5.206	51.031	67.112	3.554	170.460	0.948	1.812	41.547	0.107	-89.622	11.777	8.347
	7120.0	16.08	7.481	5.206	51.115	67.143	3.547	180.320	0.948	0.993	41.547	-4.666	-253.807	12.120	8.603
	7130.0	16.84	7.481	5.210	51.309	67.281	3.531	190.180	0.949	0.973	41.545	-9.401	-238.827	13.110	9.359
	7140.0	18.02	7.483	5.218	51.610	67.525	3.506	200.040	0.951	0.939	41.543	-14.102	-226.107	14.600	10.539
	7150.0	19.34	7.486	5.229	52.014	67.875	3.474	209.900	0.953	0.894	41.541	-18.776	-215.564	16.437	12.053
EDATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

ECATE	TIME	CV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
7029	7110.0	21.77	7.480	5.242	52.762	66.394	3.412	121.450	0.956	2.456	41.535	24.601	-24.816	19.050	14.291
317	7120.0	19.83	7.483	5.216	52.319	67.787	3.444	131.319	0.953	2.336	41.538	19.588	-33.918	16.781	12.343
	7130.0	18.17	7.477	5.196	51.972	67.326	3.469	141.179	0.951	2.210	41.540	14.628	-44.816	14.789	10.692
	7140.0	16.37	7.471	5.181	51.729	67.000	3.486	151.039	0.949	2.080	41.542	9.720	-57.889	13.154	9.424
	7150.0	14.60	7.473	5.173	51.585	66.806	3.497	161.839	0.948	1.947	41.542	4.859	-73.157	12.144	8.621
	7160.0	12.82	7.471	5.168	51.549	66.725	3.495	171.759	0.947	1.812	41.543	0.045	-89.843	11.772	8.344
	7170.0	11.05	7.472	5.168	51.643	66.758	3.490	181.619	0.948	0.993	41.542	-4.727	-253.599	12.124	8.606
	7180.0	9.28	7.473	5.172	51.830	66.898	3.474	191.477	0.949	0.972	41.541	-9.461	-238.643	13.122	9.368
	7190.0	7.53	7.471	5.180	52.147	67.146	3.450	201.339	0.950	0.939	41.539	-14.163	-225.949	14.617	10.553
	7200.0	5.75	7.474	5.192	52.545	67.500	3.416	211.192	0.952	0.893	41.536	-18.837	-215.429	16.459	12.071
7079	7110.0	21.74	7.480	5.206	53.282	66.006	3.357	121.750	0.956	2.458	41.531	24.521	-24.939	19.009	14.255
267	7120.0	19.77	7.473	5.179	52.841	67.397	3.339	131.618	0.953	2.337	41.533	19.513	-34.058	16.745	12.312
	7130.0	18.14	7.470	5.159	52.495	66.734	3.414	141.478	0.950	2.211	41.536	14.557	-44.979	14.759	10.668
	7140.0	16.87	7.467	5.144	52.253	66.617	3.431	151.338	0.948	2.081	41.537	9.652	-56.079	13.171	9.406
	7150.0	15.00	7.465	5.135	52.112	66.436	3.441	161.198	0.947	1.948	41.538	4.795	-73.366	12.130	8.610
	7160.0	13.80	7.464	5.131	52.086	66.332	3.442	171.058	0.947	1.800	41.538	-0.018	-89.930	11.768	8.340
	7170.0	12.07	7.465	5.131	52.173	66.365	3.435	180.916	0.947	0.993	41.537	-4.789	-253.387	12.128	8.609
	7180.0	10.84	7.465	5.136	52.370	66.506	3.419	191.778	0.948	0.972	41.536	-9.522	-238.456	13.134	9.378
	7190.0	9.04	7.467	5.144	52.675	66.759	3.394	201.638	0.950	0.938	41.534	-14.224	-225.789	14.636	10.568
	7200.0	7.56	7.470	5.157	53.083	67.119	3.362	211.498	0.952	0.892	41.531	-18.900	-215.292	16.482	12.090
7129	7210.0	21.69	7.473	5.170	53.804	67.511	3.302	122.057	0.955	2.460	41.527	24.441	-25.064	18.968	14.219
217	7220.0	19.75	7.467	5.143	53.363	66.998	3.334	131.917	0.952	2.339	41.529	19.437	-34.201	16.709	12.282
	7230.0	18.11	7.463	5.123	53.019	66.533	3.359	141.777	0.950	2.213	41.531	14.485	-45.145	14.728	10.643
	7240.0	16.85	7.460	5.108	52.778	66.205	3.377	151.637	0.948	2.082	41.533	9.583	-56.272	13.148	9.388
	7250.0	15.06	7.458	5.099	52.645	66.005	3.386	161.497	0.947	1.948	41.533	4.729	-73.583	12.116	8.600
	7260.0	13.79	7.457	5.095	52.615	65.931	3.383	171.357	0.946	1.800	41.533	-0.082	-89.710	11.763	8.337
	7270.0	12.07	7.457	5.095	52.703	65.966	3.300	181.217	0.947	0.993	41.533	-4.851	-253.173	12.133	8.613
	7280.0	10.83	7.458	5.100	52.902	66.111	3.364	191.077	0.948	0.972	41.532	-9.583	-238.266	13.147	9.388
	7290.0	9.04	7.460	5.109	53.209	66.365	3.340	201.937	0.949	0.937	41.530	-14.287	-225.627	14.655	10.583
	7300.0	7.57	7.463	5.122	53.618	66.728	3.307	211.797	0.952	0.892	41.527	-18.963	-215.153	16.505	12.110
7179	7200.0	21.65	7.465	5.135	54.331	67.203	3.248	122.357	0.955	2.462	41.522	24.360	-25.189	18.927	14.184
167	7210.0	19.71	7.460	5.108	53.886	66.591	3.281	132.216	0.952	2.340	41.525	19.360	-34.346	16.673	12.251
	7220.0	18.07	7.455	5.088	53.543	66.125	3.306	142.077	0.949	2.214	41.527	14.412	-45.314	14.658	10.619
	7230.0	16.82	7.452	5.073	53.303	65.796	3.324	151.937	0.947	2.083	41.528	9.514	-56.468	13.125	9.370
	7240.0	15.04	7.450	5.063	53.172	65.596	3.333	161.797	0.946	1.949	41.529	4.662	-73.804	12.102	8.589
	7250.0	13.78	7.449	5.060	53.144	65.522	3.334	171.656	0.946	1.800	41.529	-0.147	-89.481	11.759	8.334
	7260.0	12.07	7.450	5.060	53.233	65.558	3.327	181.516	0.946	0.992	41.528	-4.915	-252.956	12.139	8.617
	7270.0	10.85	7.451	5.065	53.434	65.706	3.311	191.377	0.947	0.971	41.527	-9.648	-238.074	13.161	9.398
	7280.0	9.05	7.452	5.074	53.743	65.963	3.286	201.237	0.949	0.937	41.525	-14.350	-225.462	14.674	10.599
	7290.0	7.57	7.455	5.088	54.154	66.331	3.253	211.096	0.951	0.891	41.523	-19.028	-215.013	16.529	12.130
7229	7310.0	21.61	7.458	5.101	54.849	66.794	3.195	122.656	0.955	2.464	41.518	24.278	-25.319	18.885	14.147
117	7320.0	19.67	7.452	5.074	54.409	66.177	3.228	132.516	0.951	2.342	41.521	19.283	-34.493	16.636	12.220
	7330.0	18.04	7.448	5.053	54.068	65.708	3.253	142.376	0.949	2.215	41.523	14.339	-45.485	14.668	10.594
	7340.0	16.80	7.445	5.038	53.829	65.379	3.271	152.236	0.947	2.084	41.524	9.443	-56.668	13.102	9.353
	7350.0	15.02	7.443	5.029	53.699	65.179	3.280	162.096	0.946	1.949	41.525	4.594	-74.029	12.088	8.579
	7360.0	13.77	7.442	5.025	53.680	65.099	3.281	171.956	0.946	1.800	41.525	-0.212	-89.253	11.755	8.331
	7370.0	12.06	7.442	5.026	53.765	65.143	3.274	181.816	0.946	0.992	41.524	-4.980	-252.735	12.145	8.622
	7380.0	10.85	7.443	5.031	53.967	65.293	3.258	191.676	0.947	0.971	41.523	-9.712	-237.880	13.174	9.409
	7390.0	9.06	7.445	5.040	54.277	65.553	3.233	201.536	0.949	0.936	41.521	-14.415	-225.256	14.654	10.615
	7400.0	7.60	7.448	5.055	54.690	65.925	3.200	211.396	0.951	0.890	41.519	-19.094	-214.871	16.554	12.151
ECATE	TIME	CV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1



TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATF	TIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
7279	73 00.0	21.56	7.451	5.068	55.369	66.375	3.144	122.955	0.954	2.465	41.514	24.196	-25.449	18.843	14.111
67	73 00.0	17.64	7.445	5.041	54.933	65.753	3.176	132.815	0.951	2.343	41.517	19.205	-34.642	16.600	12.190
	73 00.0	16.01	7.441	5.020	54.593	65.283	3.202	142.675	0.948	2.216	41.519	14.265	-45.655	14.637	10.569
	73 00.0	16.77	7.438	5.035	54.355	64.953	3.219	152.535	0.947	2.084	41.520	9.372	-56.871	13.079	9.335
	74 00.0	18.00	7.436	4.975	54.226	64.754	3.229	162.395	0.946	1.950	41.521	4.526	-67.256	12.074	8.569
	74 00.0	17.76	7.435	4.991	54.209	64.675	3.229	172.255	0.945	1.000	41.521	-0.279	-76.016	11.752	8.329
	74 00.0	18.06	7.435	4.992	54.296	64.719	3.222	182.115	0.946	0.992	41.520	-5.045	-85.512	12.151	8.626
	74 00.0	18.66	7.437	4.998	54.500	64.872	3.206	191.975	0.947	0.970	41.519	-9.777	-94.683	13.189	9.420
	74 00.0	18.07	7.435	5.008	54.812	65.135	3.181	201.835	0.948	0.936	41.517	-14.481	-103.128	14.715	10.632
	74 00.0	19.51	7.442	5.022	55.226	65.512	3.147	211.695	0.951	0.889	41.515	-19.161	-111.728	16.579	12.172
7329	74 00.0	21.52	7.444	5.036	55.890	65.946	3.093	123.254	0.954	2.467	41.510	24.113	-25.581	18.801	14.075
17	74 00.0	18.60	7.434	5.038	55.457	65.321	3.123	133.114	0.951	2.344	41.513	19.127	-34.793	16.563	12.159
	74 00.0	17.94	7.434	4.987	55.118	64.850	3.151	142.974	0.948	2.217	41.515	14.190	-45.836	14.607	10.545
	74 00.0	16.78	7.431	4.972	54.862	64.520	3.168	152.834	0.946	2.085	41.516	9.300	-56.077	13.056	9.317
	74 00.0	17.93	7.425	4.963	54.754	64.320	3.178	162.694	0.945	1.950	41.517	4.456	-67.487	12.061	8.558
	74 00.0	18.75	7.422	4.959	54.738	64.243	3.176	172.554	0.945	1.000	41.517	-0.346	-76.776	11.749	8.326
	74 00.0	19.66	7.422	4.959	54.835	64.282	3.170	182.414	0.945	0.992	41.516	-5.111	-86.289	12.157	8.631
	74 00.0	19.66	7.430	4.965	55.034	64.442	3.154	192.274	0.946	0.970	41.515	-9.844	-95.484	13.204	9.432
	74 00.0	19.08	7.430	4.975	55.347	64.709	3.129	202.134	0.948	0.935	41.513	-14.547	-104.959	14.736	10.649
	74 00.0	19.63	7.430	4.991	55.763	65.090	3.096	211.994	0.950	0.889	41.511	-19.228	-114.583	16.605	12.194
7477	74 00.0	23.62	7.444	5.040	56.926	66.305	3.003	113.693	0.957	2.585	41.504	29.060	-17.893	21.184	16.177
34	74 00.0	17.45	7.438	5.004	56.412	65.507	3.042	123.553	0.953	2.468	41.507	24.029	-25.715	18.759	14.038
	74 00.0	17.56	7.437	4.976	55.985	64.876	3.074	133.413	0.950	2.345	41.509	19.048	-34.945	16.526	12.128
	74 00.0	17.73	7.428	4.955	55.643	64.400	3.101	143.273	0.948	2.217	41.511	14.114	-46.015	14.576	10.520
	74 00.0	17.76	7.425	4.940	55.400	64.077	3.118	153.133	0.946	2.085	41.512	9.228	-56.286	13.033	9.299
	75 00.0	19.97	7.422	4.931	55.283	63.878	3.128	162.993	0.945	1.950	41.513	4.386	-67.722	12.047	8.548
	75 00.0	19.70	7.420	4.927	55.268	63.802	3.126	172.853	0.945	1.000	41.513	-0.415	-77.533	11.746	8.324
	75 00.0	19.66	7.422	4.928	55.366	63.843	3.120	182.713	0.945	0.992	41.512	-5.179	-87.059	12.164	8.636
	75 00.0	19.67	7.422	4.934	55.575	63.898	3.103	192.573	0.946	0.970	41.511	-9.910	-96.285	13.219	9.443
	75 00.0	19.01	7.420	4.945	55.882	64.275	3.079	202.433	0.948	0.935	41.509	-14.615	-105.787	14.757	10.667
7425	75 00.0	23.57	7.435	5.003	57.445	65.862	2.954	113.992	0.957	2.587	41.500	29.971	-18.014	21.138	16.135
93	75 00.0	21.45	7.437	4.973	56.936	65.058	2.992	123.852	0.953	2.470	41.503	23.945	-25.845	18.717	14.002
	75 00.0	19.52	7.427	4.945	56.516	64.429	3.025	133.712	0.950	2.347	41.505	18.968	-35.101	16.489	12.097
	75 00.0	17.94	7.421	4.924	56.169	63.956	3.051	143.572	0.947	2.218	41.507	14.038	-46.197	14.545	10.495
	75 00.0	18.77	7.417	4.909	55.936	63.626	3.069	153.432	0.946	2.086	41.509	9.154	-56.498	13.010	9.282
	75 00.0	19.94	7.417	4.907	55.811	63.427	3.078	163.292	0.944	1.950	41.509	4.314	-67.960	12.034	8.538
	75 00.0	19.74	7.417	4.908	55.778	63.352	3.079	173.152	0.944	1.000	41.509	-0.485	-78.286	11.743	8.322
	75 00.0	19.66	7.417	4.917	55.897	63.395	3.071	183.012	0.945	0.991	41.509	-5.247	-88.827	12.172	8.642
	75 00.0	19.67	7.417	4.923	55.107	63.553	3.054	192.872	0.946	0.969	41.507	-9.978	-98.081	13.234	9.456
	75 00.0	19.11	7.415	4.914	56.425	63.825	3.028	202.732	0.948	0.934	41.506	-14.682	-108.616	14.779	10.684
ECATF	TIME	DV SUM	DV1	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

ECATF	TIME	CV SUM *	CV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1
7163	7240.0	22.44 *	7.477	5.158	54.340 *	67.604	3.252	118.640	0.956	2.504	41.523	26.235 *	-22.155	19.819	14.965
183	7240.0	22.44 *	7.466	5.129	53.866 *	66.933	3.287	124.500	0.953	2.385	41.525	21.215 *	-30.753	17.465	12.940
	7240.0	18.65 *	7.455	5.106	53.486 *	66.414	3.315	136.360	0.950	2.260	41.528	16.247 *	-40.998	15.394	11.187
	7240.0	17.24 *	7.452	5.089	53.207 *	66.036	3.335	148.220	0.948	2.131	41.529	11.329 *	-53.312	13.655	9.785
	7240.0	16.27 *	7.452	5.078	53.035 *	65.789	3.348	153.080	0.947	1.998	41.530	6.460 *	-67.882	12.410	8.822
	7240.0	15.62 *	7.452	5.071	52.974 *	65.666	3.352	167.940	0.946	1.863	41.530	1.636 *	-84.236	11.803	8.367
	7340.0	15.90 *	7.452	5.071	53.014 *	65.666	3.348	177.800	0.946	0.997	41.530	-3.148 *	258.967	11.918	8.452
	7340.0	15.51 *	7.452	5.074	53.174 *	65.772	3.335	187.660	0.947	0.981	41.529	-7.894 *	243.352	12.716	9.055
	7340.0	17.55 *	7.454	5.061	53.443 *	65.988	3.313	197.520	0.948	0.951	41.527	-12.607 *	229.881	14.066	10.111
	7340.0	18.94 *	7.457	5.043	53.817 *	66.314	3.284	207.380	0.951	0.909	41.525	-17.293 *	218.669	15.809	11.529
7196	7240.0	23.21 *	7.465	5.148	54.883 *	67.622	3.202	115.222	0.957	2.548	41.519	28.032 *	-19.416	20.689	15.735
150	7240.0	21.07 *	7.461	5.115	54.381 *	66.886	3.239	125.082	0.954	2.431	41.522	22.997 *	-27.515	18.251	13.633
	7240.0	19.24 *	7.456	5.090	53.967 *	66.310	3.270	134.942	0.951	2.307	41.524	18.013 *	-37.120	16.104	11.774
	7340.0	17.67 *	7.452	5.071	53.651 *	65.881	3.293	144.802	0.949	2.180	41.526	13.080 *	-48.650	14.225	10.238
	7340.0	16.26 *	7.447	5.058	53.440 *	65.587	3.309	154.662	0.947	2.048	41.527	8.195 *	-62.421	12.786	9.109
	7340.0	15.91 *	7.447	5.050	53.338 *	65.419	3.316	164.522	0.946	1.913	41.528	3.356 *	-78.248	11.936	8.466
	7340.0	15.80 *	7.447	5.047	53.340 *	65.377	3.315	174.382	0.946	0.999	41.528	-1.441 *	264.918	11.751	8.357
	7340.0	16.23 *	7.447	5.049	53.460 *	65.444	3.305	184.242	0.946	0.988	41.527	-6.199 *	248.721	12.356	8.781
	7340.0	17.13 *	7.445	5.055	53.691 *	65.621	3.286	194.102	0.948	0.963	41.525	-10.923 *	234.425	13.527	9.684
	7340.0	16.43 *	7.453	5.066	54.028 *	65.909	3.259	203.962	0.950	0.926	41.523	-15.619 *	222.432	15.147	10.984
7246	7340.0	25.15 *	7.461	5.114	55.404 *	67.209	3.150	115.522	0.957	2.550	41.515	27.947 *	-19.535	20.645	15.696
100	7340.0	21.05 *	7.454	5.081	54.908 *	66.467	3.186	125.382	0.953	2.432	41.517	22.917 *	-27.651	18.251	13.598
	7340.0	19.11 *	7.445	5.056	54.491 *	65.892	3.217	135.242	0.950	2.309	41.520	17.937 *	-37.274	16.069	11.745
	7340.0	17.66 *	7.445	5.037	54.176 *	65.461	3.241	145.102	0.948	2.181	41.522	13.007 *	-48.830	14.156	10.215
	7340.0	16.53 *	7.442	5.024	53.966 *	65.167	3.256	154.962	0.947	2.048	41.523	8.125 *	-62.630	12.765	9.093
	7340.0	15.90 *	7.440	5.016	53.866 *	65.000	3.263	164.822	0.946	1.913	41.523	3.289 *	-78.478	11.925	8.457
	7340.0	15.03 *	7.444	5.013	53.877 *	64.952	3.262	174.682	0.946	0.999	41.523	-1.506 *	264.689	11.789	8.356
	7340.0	16.23 *	7.440	5.015	53.992 *	65.026	3.252	184.542	0.946	0.988	41.523	-6.264 *	248.505	12.365	8.787
	7440.0	17.14 *	7.441	5.021	54.224 *	65.206	3.234	194.402	0.947	0.963	41.521	-10.988 *	234.241	13.543	9.697
	7440.0	16.45 *	7.444	5.032	54.563 *	65.498	3.207	204.262	0.949	0.925	41.519	-15.684 *	222.272	15.168	11.001
7296	7340.0	23.11 *	7.454	5.081	55.928 *	66.786	3.098	115.821	0.957	2.552	41.511	27.862 *	-19.655	20.600	15.656
50	7340.0	21.01 *	7.447	5.049	55.427 *	66.045	3.135	125.681	0.953	2.434	41.514	22.835 *	-27.787	18.211	13.563
	7340.0	19.16 *	7.442	5.023	55.015 *	65.465	3.166	135.541	0.950	2.310	41.516	17.860 *	-37.430	16.024	11.716
	7440.0	17.63 *	7.438	5.004	54.701 *	65.033	3.189	145.401	0.948	2.181	41.518	12.933 *	-48.012	14.167	10.192
	7440.0	16.51 *	7.435	4.990	54.493 *	64.738	3.205	155.261	0.946	2.049	41.519	8.054 *	-62.841	12.744	9.077
	7440.0	15.88 *	7.433	4.982	54.394 *	64.572	3.212	165.121	0.945	1.913	41.519	3.220 *	-78.712	11.914	8.449
	7440.0	15.79 *	7.433	4.980	54.407 *	64.525	3.210	174.981	0.945	0.999	41.519	-1.573 *	264.452	11.789	8.356
	7440.0	16.23 *	7.433	4.982	54.524 *	64.601	3.201	184.841	0.946	0.987	41.519	-6.330 *	248.287	12.373	8.794
	7440.0	17.14 *	7.435	4.989	54.758 *	64.783	3.182	194.701	0.947	0.962	41.517	-11.054 *	234.052	13.559	9.710
	7440.0	16.46 *	7.437	5.000	55.098 *	65.078	3.155	204.561	0.949	0.924	41.515	-15.750 *	222.111	15.150	11.019
7346	7440.0	23.05 *	7.447	5.050	56.442 *	66.361	3.047	116.120	0.956	2.554	41.507	27.774 *	-19.778	20.554	15.616
C	7440.0	20.97 *	7.440	5.017	55.947 *	65.613	3.084	125.980	0.953	2.435	41.510	22.753 *	-27.925	18.170	13.528
	7440.0	19.12 *	7.435	4.991	55.539 *	65.029	3.115	135.840	0.950	2.311	41.512	17.782 *	-37.588	15.959	11.686
	7440.0	17.60 *	7.431	4.971	55.227 *	64.596	3.139	145.700	0.947	2.182	41.514	12.859 *	-49.198	14.139	10.169
	7440.0	16.49 *	7.428	4.958	55.020 *	64.302	3.154	155.560	0.946	2.049	41.515	7.983 *	-63.056	12.724	9.061
	7440.0	15.87 *	7.427	4.950	54.922 *	64.136	3.161	165.420	0.945	1.913	41.516	3.151 *	-78.948	11.903	8.441
	7440.0	15.78 *	7.426	4.947	54.937 *	64.090	3.160	175.280	0.945	0.999	41.515	-1.641 *	264.213	11.788	8.356
	7440.0	16.23 *	7.427	4.949	55.063 *	64.161	3.149	185.140	0.945	0.987	41.515	-6.396 *	248.065	12.382	8.801
	7540.0	17.15 *	7.428	4.957	55.292 *	64.352	3.131	195.000	0.947	0.962	41.513	-11.120 *	233.860	13.576	9.723
	7540.0	16.47 *	7.430	4.969	55.634 *	64.650	3.103	204.860	0.949	0.924	41.511	-15.818 *	221.948	15.213	11.038
ECATF	TIME	CV SUM *	CV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1

TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	DV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
7396	7470.0	23.02	7.441	5.019	56.962	65.922	2.997	116.419	0.956	2.556	41.503	27.687	-19.901	20.509	15.575
317	7480.0	20.93	7.434	4.965	56.469	65.171	3.034	124.279	0.952	2.437	41.506	22.671	-28.064	18.129	13.493
	7490.0	17.09	7.425	4.959	56.063	64.585	3.065	136.139	0.949	2.312	41.508	17.703	-37.749	15.163	11.657
	7500.0	17.57	7.425	4.940	55.753	64.151	3.089	145.999	0.947	2.183	41.510	12.784	-49.386	14.110	10.146
	7510.0	16.47	7.422	4.926	55.547	63.856	3.104	155.859	0.945	2.050	41.511	7.911	-63.274	12.703	9.045
	7520.0	15.65	7.420	4.918	55.451	63.691	3.112	165.719	0.945	1.914	41.512	3.081	-79.188	11.893	8.433
	7530.0	15.78	7.420	4.916	55.467	63.647	3.110	175.579	0.944	0.999	41.512	-1.709	-263.970	11.788	8.356
	7540.0	16.23	7.420	4.918	55.595	63.719	3.099	185.439	0.945	0.987	41.511	-6.464	-247.846	12.392	8.808
	7550.0	17.16	7.422	4.925	55.833	63.905	3.080	195.299	0.946	0.961	41.509	-11.187	-233.669	13.593	9.736
	7560.0	18.48	7.424	4.938	56.169	64.213	3.053	205.159	0.948	0.923	41.507	-15.886	-221.783	15.236	11.057
7446	7520.0	22.97	7.435	4.989	57.481	65.475	2.948	116.718	0.956	2.557	41.500	27.599	-20.025	20.463	15.535
267	7530.0	20.89	7.428	4.955	56.992	64.718	2.985	126.578	0.952	2.438	41.503	22.588	-28.204	18.089	13.458
	7540.0	19.05	7.422	4.928	56.591	64.128	3.016	136.438	0.949	2.313	41.505	17.625	-37.910	15.928	11.628
	7550.0	17.54	7.418	4.909	56.279	63.696	3.040	146.298	0.947	2.184	41.506	12.708	-45.577	14.081	10.123
	7560.0	16.45	7.416	4.895	56.075	63.402	3.055	156.158	0.945	2.050	41.508	7.837	-63.495	12.683	9.030
	7570.0	15.84	7.414	4.887	55.980	63.237	3.062	166.018	0.944	1.914	41.508	3.010	-79.432	11.882	8.425
	7580.0	15.77	7.413	4.885	55.998	63.194	3.061	175.878	0.944	0.999	41.508	-1.779	-263.725	11.789	8.356
	7590.0	16.23	7.414	4.888	56.127	63.269	3.050	185.738	0.945	0.987	41.507	-6.532	-247.615	12.402	8.816
	7600.0	17.17	7.415	4.895	56.367	63.458	3.031	195.598	0.946	0.961	41.506	-11.256	-233.472	13.611	9.751
	7610.0	18.49	7.416	4.908	56.713	63.761	3.003	205.458	0.948	0.922	41.504	-15.954	-221.619	15.260	11.076
7496	7570.0	22.92	7.429	4.959	58.000	65.017	2.899	117.017	0.955	2.559	41.496	27.511	-20.151	20.418	15.495
217	7580.0	20.84	7.422	4.925	57.517	64.255	2.936	126.877	0.952	2.439	41.499	22.504	-28.346	18.048	13.422
	7590.0	19.01	7.416	4.899	57.112	63.667	2.968	136.737	0.949	2.314	41.501	17.544	-38.076	15.892	11.598
	7600.0	17.51	7.412	4.879	56.805	63.233	2.992	146.597	0.946	2.184	41.503	12.631	-45.770	14.052	10.100
	7610.0	16.42	7.409	4.865	56.603	62.938	3.007	156.457	0.945	2.051	41.504	7.764	-63.719	12.662	9.014
	7620.0	15.83	7.408	4.857	56.510	62.774	3.014	166.317	0.944	1.914	41.505	2.938	-79.678	11.872	8.418
	7630.0	15.76	7.407	4.855	56.528	62.733	3.012	176.177	0.944	0.999	41.504	-1.849	-263.476	11.789	8.356
	7640.0	16.23	7.408	4.858	56.659	62.839	3.002	186.037	0.944	0.986	41.504	-6.602	-247.391	12.412	8.824
	7650.0	17.17	7.410	4.866	56.900	63.001	2.982	195.897	0.946	0.960	41.502	-11.325	-233.274	13.629	9.765
	7660.0	18.51	7.412	4.879	57.247	63.308	2.954	205.757	0.948	0.922	41.500	-16.024	-221.450	15.284	11.096
7546	7620.0	22.88	7.423	4.930	58.519	64.550	2.851	117.317	0.955	2.561	41.493	27.422	-20.275	20.372	15.454
167	7630.0	20.80	7.416	4.896	58.042	63.781	2.889	127.177	0.951	2.441	41.496	22.420	-28.489	18.007	13.387
	7640.0	18.94	7.410	4.869	57.635	63.196	2.921	137.036	0.948	2.315	41.498	17.464	-38.243	15.856	11.568
	7650.0	17.48	7.406	4.850	57.331	62.760	2.944	146.896	0.946	2.185	41.500	12.554	-49.966	14.023	10.077
	7660.0	16.40	7.404	4.836	57.130	62.465	2.960	156.757	0.944	2.051	41.501	7.689	-63.946	12.642	8.999
	7670.0	15.81	7.402	4.828	57.039	62.302	2.967	166.617	0.944	1.914	41.501	2.865	-79.928	11.862	8.410
	7680.0	15.76	7.402	4.826	57.059	62.262	2.965	176.477	0.943	0.999	41.501	-1.921	-263.225	11.790	8.357
	7690.0	16.23	7.402	4.829	57.191	62.341	2.954	186.336	0.944	0.986	41.500	-6.673	-247.160	12.423	8.832
	7700.0	17.18	7.404	4.837	57.433	62.535	2.934	196.197	0.945	0.960	41.499	-11.396	-233.074	13.648	9.780
	7710.0	18.52	7.406	4.850	57.782	62.845	2.906	206.057	0.947	0.921	41.497	-16.095	-221.281	15.309	11.117
7596	7670.0	22.83	7.417	4.902	59.037	64.072	2.804	117.616	0.955	2.562	41.490	27.333	-20.408	20.326	15.413
117	7680.0	20.76	7.410	4.869	58.555	63.307	2.843	127.476	0.951	2.442	41.492	22.334	-28.637	17.965	13.351
	7690.0	18.94	7.405	4.841	58.158	62.714	2.874	137.336	0.948	2.316	41.495	17.382	-38.412	15.821	11.539
	7700.0	17.45	7.400	4.821	57.862	62.272	2.897	147.196	0.946	2.186	41.496	12.477	-50.163	13.955	10.054
	7710.0	16.38	7.398	4.807	57.658	61.983	2.913	157.056	0.944	2.051	41.497	7.614	-64.177	12.622	8.983
	7720.0	15.80	7.396	4.800	57.568	61.821	2.920	166.916	0.943	1.914	41.498	2.792	-80.181	11.852	8.403
	7730.0	15.75	7.396	4.798	57.590	61.782	2.918	176.776	0.943	0.999	41.498	-1.993	-262.971	11.751	8.358
	7740.0	16.24	7.397	4.801	57.723	61.863	2.907	186.636	0.944	0.986	41.497	-6.744	-246.927	12.434	8.840
	7750.0	17.13	7.398	4.809	57.967	62.059	2.888	196.496	0.945	0.959	41.496	-11.467	-232.873	13.668	9.795
	7760.0	18.54	7.401	4.823	58.316	62.372	2.859	206.356	0.947	0.920	41.494	-16.168	-221.110	15.335	11.138
ECATE	TTIME	DV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

ECATE	TTIME	CV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
7646 67	7720.0	22.78	7.411	4.875	59.554	63.584	2.758	117.915	0.954	2.564	41.487	27.243	-20.538	20.280	15.373	
	7730.0	20.72	7.404	4.841	59.075	62.817	2.797	127.775	0.951	2.443	41.489	22.248	-28.784	17.924	13.316	
	7740.0	18.91	7.399	4.813	58.683	62.221	2.828	137.635	0.948	2.317	41.491	17.301	-38.583	15.785	11.509	
	7750.0	17.43	7.395	4.793	58.384	61.783	2.852	147.495	0.945	2.186	41.493	12.398	-50.366	13.966	10.031	
	7760.0	16.36	7.392	4.780	58.185	61.491	2.867	157.355	0.944	2.051	41.494	7.537	-64.410	12.602	8.968	
	7770.0	15.19	7.391	4.772	58.097	61.330	2.874	167.215	0.943	1.913	41.495	2.718	-80.437	11.842	8.396	
	7780.0	15.75	7.390	4.770	58.120	61.293	2.872	177.075	0.943	0.999	41.495	-2.066	-262.714	11.793	8.359	
	7790.0	16.24	7.391	4.773	58.255	61.375	2.861	186.935	0.944	0.985	41.494	-6.816	-246.691	12.446	8.849	
	7800.0	17.20	7.392	4.782	58.500	61.574	2.841	196.795	0.945	0.959	41.492	-11.540	-232.669	13.688	9.811	
7810.0	18.55	7.396	4.796	58.850	61.890	2.813	206.655	0.947	0.920	41.490	-16.241	-220.937	15.360	11.159		
7696 17	7770.0	22.74	7.406	4.849	60.071	63.086	2.713	118.214	0.954	2.565	41.484	27.152	-20.665	20.234	15.332	
	7780.0	20.68	7.395	4.814	59.595	62.316	2.751	128.074	0.950	2.444	41.486	22.162	-28.934	17.882	13.280	
	7790.0	18.87	7.394	4.786	59.208	61.716	2.782	137.934	0.947	2.318	41.488	17.218	-38.756	15.749	11.479	
	7800.0	17.40	7.390	4.766	58.907	61.287	2.807	147.794	0.945	2.187	41.490	12.318	-50.571	13.937	10.008	
	7810.0	16.34	7.387	4.752	58.712	60.989	2.822	157.654	0.943	2.051	41.491	7.461	-64.647	12.582	8.952	
	7820.0	15.77	7.385	4.745	58.626	60.829	2.829	167.514	0.943	1.913	41.492	2.643	-80.696	11.833	8.389	
	7830.0	15.75	7.385	4.743	58.651	60.793	2.827	177.374	0.943	0.999	41.491	-2.139	-262.454	11.755	8.360	
	7840.0	16.24	7.386	4.747	58.787	60.877	2.816	187.234	0.943	0.985	41.491	-6.889	-246.454	12.458	8.859	
	7850.0	17.21	7.388	4.756	59.033	61.078	2.796	197.094	0.945	0.958	41.489	-11.613	-232.464	13.708	9.827	
7860.0	18.57	7.390	4.770	59.384	61.398	2.767	206.954	0.947	0.919	41.487	-16.314	-220.764	15.387	11.181		
7746 33	7820.0	22.69	7.401	4.823	60.586	62.576	2.668	118.513	0.954	2.567	41.481	27.061	-20.802	20.188	15.291	
	7830.0	20.64	7.394	4.788	60.114	61.804	2.707	128.373	0.950	2.445	41.483	22.075	-29.085	17.840	13.244	
	7840.0	18.84	7.388	4.760	59.734	61.200	2.738	138.233	0.947	2.319	41.485	17.136	-38.931	15.713	11.449	
	7850.0	17.37	7.384	4.740	59.426	60.775	2.763	148.093	0.945	2.187	41.487	12.237	-50.780	13.907	9.985	
	7860.0	16.32	7.382	4.726	59.245	60.471	2.777	157.953	0.943	2.052	41.488	7.384	-64.884	12.562	8.937	
	7870.0	15.76	7.380	4.718	59.155	60.318	2.785	167.813	0.942	1.913	41.489	2.567	-80.958	11.824	8.382	
	7880.0	15.74	7.380	4.717	59.181	60.284	2.782	177.673	0.942	0.998	41.488	-2.214	-262.192	11.797	8.362	
	7890.0	16.25	7.381	4.721	59.319	60.370	2.771	187.533	0.943	0.985	41.488	-6.963	-246.214	12.471	8.868	
	7900.0	17.23	7.383	4.730	59.566	60.573	2.751	197.393	0.944	0.958	41.486	-11.687	-232.257	13.729	9.843	
7910.0	18.59	7.385	4.745	59.918	60.895	2.722	207.253	0.947	0.918	41.484	-16.389	-220.589	15.414	11.203		
7796 83	7870.0	22.65	7.396	4.798	61.101	62.056	2.624	118.812	0.954	2.568	41.478	26.970	-20.936	20.141	15.250	
	7880.0	20.60	7.389	4.762	60.632	61.281	2.663	128.672	0.950	2.446	41.481	21.988	-29.237	17.798	13.208	
	7890.0	18.80	7.387	4.735	60.247	60.684	2.695	138.532	0.947	2.319	41.483	17.051	-39.111	15.676	11.419	
	7900.0	17.34	7.379	4.714	59.956	60.246	2.719	148.392	0.944	2.187	41.484	12.157	-50.987	13.879	9.962	
	7910.0	16.33	7.377	4.700	59.768	59.952	2.734	158.252	0.943	2.052	41.485	7.305	-65.128	12.542	8.922	
	7920.0	15.75	7.375	4.693	59.683	59.797	2.741	168.112	0.942	1.913	41.486	2.490	-81.224	11.815	8.375	
	7930.0	15.74	7.375	4.691	59.711	59.764	2.739	177.972	0.942	0.998	41.486	-2.289	-261.927	11.759	8.364	
	7940.0	16.25	7.376	4.695	59.850	59.852	2.727	187.832	0.943	0.985	41.485	-7.038	-245.973	12.484	8.878	
	7950.0	17.24	7.378	4.705	60.098	60.057	2.707	197.692	0.944	0.957	41.483	-11.762	-232.049	13.750	9.860	
7960.0	18.61	7.381	4.721	60.451	60.382	2.678	207.552	0.946	0.917	41.482	-16.465	-220.412	15.441	11.225		
ECATE	TTIME	CV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATE	TIME	CV	SUM *	CV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1 *	PHI1	VINF1	DV1	
7530 183	7610.0	21.55	*	7.420	4.917	58.033	*	64.201	2.892	123.460	0.953	2.485	41.496	24.278	-25.275	18.868	14.133
	7620.0	19.68	*	7.414	4.888	57.600	*	63.550	2.925	133.320	0.949	2.362	41.498	19.304	-34.406	16.627	12.213
	7630.0	18.00	*	7.405	4.865	57.265	*	63.053	2.951	143.180	0.947	2.233	41.500	14.377	-45.347	14.662	10.590
	7640.0	16.75	*	7.406	4.850	57.019	*	62.713	2.971	153.040	0.945	2.100	41.501	9.494	-58.481	13.095	9.347
	7650.0	15.97	*	7.404	4.840	56.887	*	62.503	2.981	162.900	0.944	1.964	41.502	4.655	-73.802	12.174	8.569
	7660.0	15.17	*	7.403	4.836	56.805	*	62.418	2.982	172.760	0.943	1.800	41.502	-0.145	-269.488	11.133	8.314
	7670.0	16.00	*	7.404	4.837	56.956	*	62.453	2.975	182.620	0.944	0.992	41.502	-4.909	-252.949	12.112	8.597
	7680.0	16.74	*	7.405	4.843	57.158	*	62.604	2.958	192.480	0.945	0.971	41.501	-9.642	-238.046	13.134	9.378
	7690.0	17.99	*	7.407	4.854	57.467	*	62.870	2.933	202.340	0.947	0.937	41.499	-14.350	-225.412	14.651	10.581
	7700.0	19.53	*	7.410	4.870	57.879	*	63.254	2.903	212.200	0.949	0.891	41.496	-19.037	-214.941	16.512	12.115
7564 150	7690.0	22.24	*	7.419	4.911	58.562	*	64.165	2.846	121.042	0.954	2.530	41.493	26.056	-22.382	19.711	14.870
	7690.0	20.28	*	7.412	4.878	58.105	*	63.444	2.882	129.902	0.950	2.408	41.495	21.068	-30.967	17.396	12.864
	7690.0	18.53	*	7.407	4.854	57.726	*	62.859	2.911	139.762	0.948	2.281	41.497	16.126	-41.212	15.321	11.127
	7690.0	17.14	*	7.403	4.835	57.450	*	62.502	2.933	149.622	0.945	2.150	41.499	11.229	-52.533	13.556	9.739
	7690.0	16.19	*	7.401	4.823	57.278	*	62.243	2.946	159.482	0.944	2.015	41.500	6.376	-68.114	12.364	8.787
	7690.0	15.14	*	7.400	4.817	57.217	*	62.114	2.951	169.342	0.943	1.877	41.500	1.564	-84.478	11.769	8.341
	7700.0	15.03	*	7.400	4.816	57.267	*	62.107	2.947	179.202	0.943	0.997	41.500	-3.212	-258.725	11.854	8.434
	7710.0	16.45	*	7.401	4.821	57.435	*	62.217	2.933	189.062	0.944	0.980	41.499	-7.956	-243.115	12.702	9.045
	7720.0	17.51	*	7.402	4.830	57.701	*	62.442	2.911	198.922	0.946	0.950	41.497	-12.672	-229.652	14.061	10.107
	7730.0	18.94	*	7.405	4.845	58.077	*	62.785	2.881	208.782	0.948	0.908	41.495	-17.367	-218.447	15.815	11.534
7614 100	7690.0	22.24	*	7.413	4.883	59.081	*	63.683	2.799	120.342	0.954	2.531	41.490	25.968	-22.515	19.666	14.831
	7700.0	20.24	*	7.406	4.851	58.621	*	62.964	2.836	130.202	0.950	2.409	41.492	20.983	-31.121	17.356	12.830
	7710.0	18.50	*	7.401	4.825	58.254	*	62.410	2.865	140.062	0.947	2.282	41.494	16.046	-41.385	15.287	11.099
	7720.0	17.12	*	7.398	4.807	57.984	*	62.009	2.886	149.922	0.945	2.150	41.495	11.153	-53.738	13.570	9.718
	7730.0	16.17	*	7.395	4.795	57.806	*	61.758	2.900	159.782	0.944	2.015	41.496	6.301	-68.353	12.366	8.774
	7740.0	15.73	*	7.394	4.789	57.747	*	61.630	2.904	169.642	0.943	1.877	41.497	1.490	-84.735	11.762	8.336
	7750.0	15.83	*	7.394	4.788	57.799	*	61.624	2.900	179.502	0.943	0.997	41.496	-3.284	-258.474	11.898	8.437
	7760.0	16.45	*	7.395	4.793	57.962	*	61.736	2.887	189.362	0.944	0.980	41.496	-8.028	-242.889	12.716	9.055
	7770.0	17.52	*	7.397	4.803	58.234	*	61.964	2.865	199.222	0.946	0.950	41.494	-12.744	-229.458	14.082	10.124
	7780.0	18.96	*	7.400	4.818	58.611	*	62.310	2.834	209.082	0.948	0.908	41.492	-17.440	-218.282	15.842	11.556
7664 50	7740.0	22.20	*	7.402	4.856	59.599	*	63.190	2.753	120.641	0.953	2.533	41.486	25.879	-22.650	19.621	14.791
	7750.0	20.21	*	7.401	4.823	59.142	*	62.470	2.790	130.501	0.950	2.411	41.489	20.899	-31.275	17.316	12.796
	7760.0	18.47	*	7.396	4.798	58.774	*	61.918	2.819	140.361	0.947	2.283	41.491	15.964	-41.570	15.253	11.071
	7770.0	17.00	*	7.392	4.779	58.505	*	61.517	2.841	150.221	0.945	2.151	41.492	11.074	-53.951	13.543	9.697
	7780.0	16.15	*	7.390	4.767	58.334	*	61.263	2.854	160.081	0.943	2.015	41.493	6.225	-68.595	12.329	8.760
	7790.0	15.72	*	7.385	4.761	58.276	*	61.136	2.859	169.941	0.943	1.876	41.494	1.416	-84.995	11.756	8.331
	7800.0	15.63	*	7.385	4.761	58.330	*	61.131	2.854	179.801	0.943	0.996	41.493	-3.357	-258.220	11.903	8.441
	7810.0	16.46	*	7.390	4.766	58.494	*	61.245	2.841	189.661	0.944	0.980	41.492	-8.100	-242.661	12.730	9.066
	7820.0	17.53	*	7.392	4.776	58.768	*	61.476	2.819	199.521	0.945	0.949	41.491	-12.817	-229.263	14.104	10.141
	7830.0	18.97	*	7.395	4.792	59.146	*	61.825	2.788	209.381	0.946	0.907	41.489	-17.513	-218.117	15.869	11.579
7714 C	7790.0	22.15	*	7.402	4.829	60.116	*	62.687	2.708	120.940	0.953	2.534	41.484	25.790	-22.786	19.576	14.752
	7800.0	20.16	*	7.396	4.797	59.662	*	61.964	2.745	130.800	0.949	2.412	41.486	20.813	-31.430	17.276	12.762
	7810.0	18.43	*	7.391	4.771	59.293	*	61.413	2.774	140.660	0.947	2.284	41.488	15.882	-41.751	15.219	11.042
	7820.0	17.06	*	7.387	4.753	59.029	*	61.013	2.796	150.520	0.944	2.151	41.489	10.995	-54.166	13.516	9.676
	7830.0	16.13	*	7.385	4.741	58.862	*	60.758	2.809	160.380	0.943	2.015	41.490	6.149	-68.840	12.312	8.747
	7840.0	15.71	*	7.383	4.735	58.805	*	60.632	2.814	170.240	0.942	1.876	41.491	1.342	-85.258	11.749	8.327
	7850.0	15.63	*	7.382	4.734	58.860	*	60.620	2.809	180.100	0.943	0.996	41.490	-3.431	-257.963	11.908	8.444
	7860.0	16.46	*	7.384	4.740	59.026	*	60.745	2.796	190.960	0.943	0.979	41.489	-8.174	-242.431	12.745	9.077
	7870.0	17.55	*	7.386	4.750	59.301	*	60.978	2.773	199.820	0.945	0.949	41.488	-12.891	-229.066	14.127	10.159
	7880.0	18.99	*	7.390	4.766	59.680	*	61.330	2.742	209.680	0.947	0.906	41.486	-17.588	-217.950	15.857	11.600

EDATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
7764	7840.0	22.11	7.397	4.804	60.632	62.173	2.664	121.239	0.953	2.536	41.481	25.700	-22.923	19.531	14.712
317	7850.0	20.12	7.391	4.771	60.182	61.449	2.701	131.099	0.949	2.413	41.483	20.727	-31.586	17.235	12.727
	7860.0	18.40	7.385	4.745	59.824	60.891	2.730	140.959	0.946	2.284	41.485	15.800	-41.935	15.184	11.014
	7870.0	17.04	7.382	4.727	59.552	60.498	2.752	150.819	0.944	2.151	41.486	10.915	-54.383	13.489	9.655
	7880.0	16.11	7.375	4.714	59.397	60.235	2.765	160.679	0.943	2.015	41.487	6.073	-65.085	12.294	8.734
	7890.0	15.70	7.372	4.709	59.334	60.118	2.770	170.539	0.942	1.876	41.488	1.266	-85.523	11.743	8.322
	7900.0	15.83	7.378	4.708	59.391	60.116	2.765	180.399	0.942	0.996	41.487	-3.506	-257.705	11.913	8.448
	7910.0	16.47	7.375	4.714	59.558	60.234	2.751	190.259	0.943	0.979	41.486	-8.248	-242.199	12.760	9.089
	7920.0	17.56	7.381	4.725	59.834	60.469	2.729	200.119	0.945	0.948	41.485	-12.965	-228.868	14.149	10.177
	7930.0	19.01	7.385	4.741	60.213	60.825	2.698	209.979	0.947	0.905	41.483	-17.663	-217.782	15.926	11.626
7814	7890.0	22.06	7.392	4.779	61.148	61.648	2.620	121.538	0.952	2.537	41.478	25.609	-23.062	19.485	14.672
267	7900.0	20.08	7.386	4.746	60.701	60.922	2.657	131.398	0.949	2.413	41.480	20.641	-31.747	17.155	12.693
	7910.0	18.37	7.381	4.720	60.341	60.369	2.687	141.258	0.946	2.285	41.482	15.716	-42.123	15.150	10.986
	7920.0	17.01	7.377	4.701	60.076	59.972	2.709	151.118	0.944	2.152	41.484	10.835	-54.602	13.462	9.634
	7930.0	16.10	7.374	4.689	59.920	59.713	2.722	160.978	0.942	2.015	41.484	5.994	-65.338	12.277	8.721
	7940.0	15.69	7.372	4.683	59.863	59.593	2.726	170.838	0.942	1.875	41.485	1.190	-85.792	11.737	8.318
	7950.0	15.83	7.372	4.683	59.921	59.593	2.722	180.698	0.942	0.996	41.484	-3.581	-257.443	11.918	8.452
	7960.0	16.48	7.374	4.689	60.089	59.713	2.708	190.558	0.943	0.978	41.483	-8.323	-241.965	12.776	9.101
	7970.0	17.57	7.377	4.700	60.366	59.951	2.685	200.418	0.945	0.948	41.482	-13.040	-228.666	14.173	10.196
	7980.0	19.03	7.380	4.717	60.746	60.309	2.654	210.278	0.947	0.905	41.480	-17.739	-217.613	15.955	11.650
7864	7940.0	22.02	7.387	4.754	61.663	61.111	2.578	121.837	0.952	2.538	41.475	25.518	-23.203	19.440	14.632
217	7950.0	20.04	7.381	4.721	61.219	60.384	2.615	131.697	0.949	2.414	41.478	20.554	-31.909	17.154	12.658
	7960.0	18.33	7.376	4.695	60.862	59.831	2.644	141.557	0.946	2.285	41.479	15.633	-42.312	15.115	10.958
	7970.0	16.98	7.372	4.676	60.601	59.433	2.666	151.417	0.944	2.152	41.481	10.754	-54.824	13.436	9.613
	7980.0	16.08	7.370	4.664	60.443	59.179	2.679	161.277	0.942	2.015	41.482	5.915	-65.593	12.260	8.708
	7990.0	15.68	7.369	4.659	60.391	59.058	2.684	171.137	0.942	1.875	41.482	1.113	-86.063	11.732	8.314
	8000.0	15.83	7.369	4.659	60.450	59.060	2.679	180.997	0.942	0.996	41.482	-3.657	-257.180	11.924	8.457
	8010.0	16.48	7.370	4.665	60.620	59.181	2.665	190.857	0.943	0.978	41.481	-8.398	-241.730	12.752	9.113
	8020.0	17.59	7.372	4.676	60.898	59.421	2.642	200.717	0.944	0.947	41.479	-13.116	-228.467	14.156	10.215
	8030.0	19.05	7.375	4.694	61.278	59.782	2.610	210.577	0.947	0.904	41.477	-17.817	-217.443	15.984	11.675
7914	7990.0	21.98	7.383	4.731	62.176	60.563	2.535	122.136	0.952	2.539	41.473	25.427	-23.345	19.394	14.592
167	8000.0	20.00	7.376	4.697	61.737	59.835	2.573	131.997	0.948	2.415	41.475	20.466	-32.071	17.114	12.624
	8010.0	18.30	7.371	4.671	61.382	59.282	2.603	141.857	0.945	2.286	41.477	15.548	-42.503	15.080	10.930
	8020.0	16.96	7.367	4.652	61.127	58.882	2.624	151.716	0.943	2.152	41.478	10.673	-55.048	13.409	9.592
	8030.0	16.06	7.365	4.640	60.967	58.633	2.637	161.576	0.942	2.015	41.479	5.836	-69.851	12.243	8.696
	8040.0	15.67	7.364	4.634	60.925	58.505	2.641	171.437	0.941	1.875	41.479	1.036	-86.334	11.726	8.310
	8050.0	15.83	7.364	4.635	60.979	58.516	2.637	181.297	0.942	0.996	41.479	-3.734	-256.914	11.931	8.461
	8060.0	16.49	7.365	4.641	61.150	58.638	2.623	191.156	0.943	0.978	41.478	-8.475	-241.492	12.808	9.126
	8070.0	17.60	7.368	4.653	61.429	58.880	2.599	201.016	0.944	0.946	41.477	-13.193	-228.264	14.221	10.234
	8080.0	19.07	7.371	4.671	61.810	59.244	2.568	210.877	0.947	0.903	41.475	-17.894	-217.272	16.014	11.699
7964	8040.0	21.93	7.378	4.708	62.689	60.002	2.494	122.436	0.952	2.540	41.470	25.335	-23.488	19.349	14.552
117	8050.0	19.96	7.372	4.674	62.253	59.274	2.531	132.296	0.948	2.416	41.472	20.378	-32.236	17.073	12.589
	8060.0	18.27	7.367	4.648	61.902	58.722	2.561	142.156	0.945	2.286	41.474	15.464	-42.696	15.046	10.901
	8070.0	16.93	7.363	4.629	61.653	58.319	2.583	152.016	0.943	2.152	41.476	10.591	-55.275	13.382	9.571
	8080.0	16.04	7.361	4.617	61.491	58.075	2.596	161.876	0.942	2.014	41.476	5.756	-70.111	12.226	8.683
	8090.0	15.67	7.359	4.611	61.448	57.952	2.600	171.736	0.941	1.874	41.477	0.957	-86.613	11.721	8.306
	8100.0	15.83	7.360	4.612	61.507	57.960	2.595	181.596	0.941	0.995	41.476	-3.812	-256.646	11.937	8.466
	8110.0	16.50	7.361	4.618	61.680	58.085	2.581	191.456	0.942	0.977	41.475	-8.552	-241.253	12.825	9.139
	8120.0	17.62	7.363	4.631	61.959	58.328	2.558	201.316	0.944	0.946	41.474	-13.271	-228.061	14.245	10.254
	8130.0	19.09	7.367	4.649	62.341	58.694	2.526	211.176	0.946	0.902	41.472	-17.973	-217.100	16.045	11.725
EDATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	DV	SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
8014 67	8090.0	21.89	7.374	4.685	63.200	59.429	2.454	122.735	0.951	2.542	41.468	25.243	-23.632	19.303	14.512	
	8100.0	19.92	7.367	4.651	62.768	58.701	2.491	132.595	0.948	2.417	41.470	20.289	-32.403	17.032	12.554	
	8110.0	18.24	7.362	4.625	62.420	58.150	2.521	142.455	0.945	2.287	41.472	15.378	-42.892	15.011	10.873	
	8120.0	16.91	7.358	4.606	62.167	57.756	2.543	152.315	0.943	2.152	41.473	10.507	-55.507	13.355	9.550	
	8130.0	16.03	7.356	4.594	62.016	57.505	2.556	162.175	0.941	2.014	41.474	5.675	-70.374	12.210	8.671	
	8140.0	15.66	7.355	4.589	61.971	57.387	2.560	172.035	0.941	1.874	41.474	0.877	-76.894	11.716	8.302	
	8150.0	15.83	7.355	4.589	62.043	57.385	2.554	181.895	0.941	0.995	41.474	-3.889	-256.379	11.944	8.471	
	8160.0	16.51	7.357	4.596	62.208	57.520	2.540	191.755	0.942	0.977	41.473	-8.630	-241.013	12.842	9.152	
	8170.0	17.63	7.359	4.609	62.489	57.765	2.517	201.615	0.944	0.945	41.471	-13.349	-227.856	14.270	10.274	
	8180.0	19.11	7.363	4.627	62.871	58.133	2.485	211.475	0.946	0.901	41.470	-18.053	-216.926	16.076	11.751	
8064 17	8140.0	21.84	7.370	4.664	63.711	58.844	2.414	123.034	0.951	2.543	41.465	25.150	-23.778	19.257	14.472	
	8150.0	19.88	7.362	4.630	63.282	58.116	2.451	132.894	0.948	2.417	41.468	20.200	-32.571	16.991	12.520	
	8160.0	18.20	7.358	4.603	62.938	57.566	2.481	142.754	0.945	2.287	41.469	15.292	-43.090	14.976	10.845	
	8170.0	16.88	7.354	4.584	62.687	57.174	2.503	152.614	0.943	2.152	41.471	10.424	-55.740	13.329	9.529	
	8180.0	16.01	7.352	4.572	62.541	56.922	2.516	162.474	0.941	2.014	41.471	5.594	-70.638	12.193	8.658	
	8190.0	15.65	7.351	4.567	62.495	56.809	2.520	172.334	0.941	1.873	41.472	0.797	-87.176	11.712	8.299	
	8200.0	15.83	7.351	4.567	62.566	56.811	2.514	182.194	0.941	0.995	41.471	-3.968	-256.105	11.952	8.477	
	8210.0	16.52	7.352	4.574	62.736	56.943	2.500	192.054	0.942	0.976	41.470	-8.709	-240.770	12.860	9.165	
	8220.0	17.65	7.355	4.587	63.017	57.190	2.477	201.914	0.944	0.944	41.469	-13.429	-227.650	14.296	10.295	
	8230.0	19.14	7.359	4.607	63.399	57.559	2.444	211.774	0.946	0.900	41.467	-18.133	-216.752	16.107	11.777	
8114 33	8190.0	21.80	7.365	4.642	64.220	58.246	2.374	123.333	0.951	2.544	41.463	25.056	-23.926	19.211	14.432	
	8200.0	19.84	7.359	4.608	63.795	57.519	2.412	133.193	0.947	2.418	41.465	20.110	-32.741	16.950	12.485	
	8210.0	18.17	7.354	4.582	63.454	56.970	2.442	143.053	0.944	2.287	41.467	15.205	-43.290	14.942	10.816	
	8220.0	16.86	7.350	4.563	63.206	56.580	2.464	152.913	0.942	2.152	41.468	10.340	-55.976	13.302	9.508	
	8230.0	15.97	7.348	4.550	63.066	56.325	2.477	162.773	0.941	2.014	41.469	5.512	-70.906	12.177	8.646	
	8240.0	15.64	7.347	4.545	63.019	56.217	2.481	172.633	0.940	1.872	41.469	0.716	-87.461	11.707	8.296	
	8250.0	15.83	7.347	4.546	63.089	56.224	2.475	182.493	0.941	0.995	41.469	-4.049	-255.829	11.959	8.483	
	8260.0	16.53	7.348	4.553	63.271	56.345	2.460	192.353	0.942	0.976	41.468	-8.788	-240.530	12.877	9.179	
	8270.0	17.67	7.351	4.567	63.545	56.602	2.437	202.213	0.944	0.944	41.467	-13.509	-227.442	14.322	10.315	
	8280.0	19.16	7.355	4.586	63.927	56.973	2.404	212.073	0.946	0.900	41.465	-18.214	-216.577	16.129	11.803	
8164 83	8240.0	21.75	7.361	4.622	64.728	57.635	2.336	123.632	0.951	2.545	41.461	24.963	-24.074	19.165	14.391	
	8250.0	19.80	7.355	4.587	64.307	56.909	2.374	133.492	0.947	2.419	41.463	20.020	-32.913	16.909	12.450	
	8260.0	18.14	7.350	4.561	63.969	56.362	2.404	143.352	0.944	2.288	41.465	15.118	-43.492	14.907	10.788	
	8270.0	16.83	7.346	4.542	63.725	55.973	2.426	153.212	0.942	2.152	41.466	10.255	-56.214	13.275	9.488	
	8280.0	15.98	7.344	4.530	63.580	55.728	2.439	163.072	0.941	2.013	41.467	5.429	-71.180	12.161	8.634	
	8290.0	15.64	7.343	4.524	63.543	55.613	2.443	172.932	0.940	1.872	41.467	0.635	-87.748	11.703	8.293	
	8300.0	15.83	7.343	4.526	63.612	55.624	2.437	182.792	0.940	0.995	41.467	-4.129	-255.552	11.967	8.489	
	8310.0	16.54	7.345	4.533	63.793	55.749	2.422	192.652	0.942	0.975	41.466	-8.869	-240.283	12.856	9.193	
	8320.0	17.68	7.347	4.547	64.071	56.003	2.398	202.512	0.943	0.943	41.464	-13.589	-227.234	14.348	10.337	
	8330.0	19.18	7.351	4.567	64.454	56.375	2.365	212.372	0.946	0.899	41.463	-18.296	-216.401	16.171	11.830	
ECATE	TTIME	DV	SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

ECATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
7897	7970.0	22.77 *	7.487	4.753	62.190	61.058	2.534	118.420	0.953	2.583	41.472	27.289	-20.441	20.292	15.383
183	7970.0	23.71 *	7.380	4.716	61.720	60.261	2.573	128.280	0.950	2.461	41.475	22.311	-28.643	17.941	13.330
	7980.0	14.90 *	7.374	4.688	61.337	59.646	2.606	138.140	0.947	2.334	41.477	17.376	-38.385	15.804	11.525
	8000.0	17.41 *	7.370	4.666	61.043	59.187	2.630	148.000	0.944	2.202	41.478	12.485	-40.108	13.982	10.044
	8010.0	15.34 *	7.367	4.652	60.841	58.891	2.647	157.860	0.942	2.065	41.480	7.633	-44.092	12.609	8.974
	8020.0	15.76 *	7.366	4.643	60.756	58.717	2.654	167.720	0.942	1.926	41.480	2.819	-48.075	11.837	8.392
	8030.0	15.71 *	7.365	4.642	60.771	58.680	2.653	177.580	0.941	0.999	41.480	-1.962	-52.071	11.772	8.343
	8040.0	15.19 *	7.366	4.646	60.902	58.758	2.642	187.440	0.942	0.986	41.479	-6.713	-56.004	12.411	8.823
	8050.0	17.14 *	7.368	4.656	61.141	58.956	2.623	197.300	0.944	0.959	41.478	-11.439	-60.075	13.643	9.776
	8060.0	16.44 *	7.371	4.671	61.485	59.273	2.594	207.160	0.946	0.920	41.476	-16.145	-64.126	15.311	11.118
7931	8070.0	21.41 *	7.375	4.713	62.230	60.158	2.532	124.862	0.951	2.507	41.472	24.072	-25.575	18.753	14.033
150	8070.0	14.50 *	7.373	4.681	61.813	59.478	2.567	134.722	0.947	2.382	41.475	19.124	-34.720	16.531	12.132
	8070.0	17.89 *	7.364	4.657	61.484	58.969	2.595	144.582	0.945	2.251	41.476	14.219	-45.689	14.584	10.526
	8080.0	16.87 *	7.365	4.640	61.255	58.611	2.614	154.442	0.943	2.116	41.477	9.354	-56.854	13.035	9.301
	8090.0	15.30 *	7.362	4.630	61.126	58.396	2.625	164.302	0.942	1.978	41.478	4.528	-67.208	12.033	8.538
	8060.0	15.86 *	7.362	4.626	61.115	58.301	2.626	174.162	0.941	1.000	41.478	-0.262	-77.071	11.709	8.297
	8070.0	15.96 *	7.367	4.628	61.147	58.346	2.614	184.022	0.942	0.992	41.478	-5.024	-86.540	12.106	8.593
	8080.0	16.75 *	7.364	4.636	61.398	58.500	2.603	193.882	0.943	0.970	41.477	-9.759	-95.667	13.145	9.386
	8090.0	17.97 *	7.367	4.649	61.705	58.775	2.577	203.742	0.945	0.936	41.475	-14.472	-104.067	14.675	10.600
	8100.0	19.52 *	7.371	4.669	62.112	59.173	2.543	213.602	0.947	0.889	41.473	-19.170	-113.624	16.549	12.147
7981	8060.0	21.37 *	7.375	4.690	62.743	59.593	2.491	125.162	0.951	2.508	41.470	23.981	-25.724	18.709	13.994
100	8070.0	19.47 *	7.365	4.658	62.330	58.914	2.526	135.022	0.947	2.382	41.472	19.036	-34.892	16.452	12.099
	8080.0	17.86 *	7.364	4.634	62.004	58.405	2.554	144.882	0.944	2.251	41.474	14.134	-45.892	14.551	10.500
	8090.0	16.84 *	7.361	4.617	61.741	58.044	2.573	154.742	0.943	2.116	41.475	9.273	-56.091	13.011	9.282
	8100.0	15.84 *	7.359	4.607	61.654	57.831	2.584	164.602	0.941	1.977	41.476	4.449	-67.475	12.019	8.527
	8110.0	15.65 *	7.358	4.603	61.637	57.745	2.585	174.462	0.941	1.000	41.476	-0.341	-77.790	11.707	8.296
	8120.0	15.96 *	7.358	4.605	61.726	57.787	2.578	184.322	0.941	0.992	41.475	-5.102	-87.277	12.116	8.600
	8130.0	16.76 *	7.360	4.613	61.927	57.943	2.561	194.182	0.943	0.970	41.474	-9.836	-96.437	13.164	9.401
	8140.0	17.98 *	7.362	4.627	62.235	58.219	2.536	204.042	0.945	0.935	41.473	-14.550	-105.872	14.702	10.622
	8150.0	19.94 *	7.366	4.647	62.643	58.619	2.501	213.902	0.947	0.888	41.471	-19.249	-115.459	16.561	12.174
8031	8110.0	21.33 *	7.370	4.668	63.255	59.016	2.450	125.461	0.950	2.509	41.467	23.889	-25.874	18.664	13.955
50	8120.0	19.43 *	7.364	4.636	62.846	58.337	2.486	135.321	0.947	2.383	41.470	18.948	-35.067	16.452	12.066
	8130.0	17.83 *	7.360	4.612	62.523	57.829	2.514	145.181	0.944	2.251	41.471	14.049	-46.097	14.518	10.473
	8140.0	16.62 *	7.356	4.595	62.297	57.476	2.533	155.041	0.942	2.116	41.472	9.190	-56.333	12.986	9.263
	8150.0	15.87 *	7.354	4.584	62.175	57.262	2.544	164.901	0.941	1.977	41.473	4.368	-67.747	12.005	8.517
	8160.0	15.65 *	7.354	4.580	62.161	57.176	2.545	174.761	0.941	1.000	41.473	-0.421	-77.509	11.706	8.295
	8170.0	15.96 *	7.354	4.583	62.253	57.217	2.538	184.621	0.941	0.992	41.473	-5.180	-86.013	12.126	8.607
	8180.0	16.77 *	7.356	4.591	62.456	57.375	2.521	194.481	0.942	0.969	41.472	-9.915	-95.205	13.183	9.416
	8190.0	18.07 *	7.358	4.606	62.764	57.657	2.495	204.341	0.944	0.934	41.470	-14.629	-104.675	14.729	10.644
	8200.0	19.56 *	7.362	4.626	63.172	58.054	2.460	214.201	0.947	0.887	41.468	-19.329	-114.293	16.614	12.201
8081	8150.0	23.40 *	7.374	4.686	64.248	59.298	2.368	115.900	0.954	2.631	41.463	28.777	-18.225	21.014	16.025
0	8160.0	21.28 *	7.366	4.646	63.766	58.426	2.411	125.760	0.950	2.510	41.465	23.797	-26.026	18.619	13.916
	8170.0	19.39 *	7.360	4.614	63.360	57.748	2.446	135.620	0.947	2.383	41.467	18.860	-35.243	16.413	12.032
	8180.0	17.80 *	7.355	4.590	63.041	57.247	2.474	145.480	0.944	2.252	41.469	13.964	-46.305	14.485	10.447
	8190.0	16.60 *	7.352	4.573	62.818	56.890	2.494	155.340	0.942	2.116	41.470	9.107	-56.577	12.962	9.244
	8200.0	15.86 *	7.350	4.562	62.699	56.675	2.504	165.200	0.941	1.977	41.471	4.287	-67.020	11.952	8.507
	8210.0	15.64 *	7.349	4.559	62.684	56.595	2.506	175.060	0.941	1.000	41.471	-0.501	-76.224	11.705	8.294
	8220.0	15.97 *	7.350	4.561	62.785	56.629	2.498	184.920	0.941	0.991	41.470	-5.259	-85.748	12.136	8.615
	8230.0	16.78 *	7.352	4.570	62.984	56.794	2.481	194.780	0.942	0.969	41.469	-9.994	-95.972	13.204	9.432
	8240.0	18.02 *	7.354	4.585	63.292	57.073	2.455	204.640	0.944	0.934	41.468	-14.709	-105.478	14.756	10.666
ECATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1



TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
8131	8200.0	23.35	7.270	4.666	64.753	58.695	2.329	116.199	0.954	2.632	41.460	28.680	-18.360	20.965	15.981
317	8210.0	21.24	7.362	4.625	64.276	57.824	2.372	126.059	0.950	2.511	41.463	23.705	-26.179	18.574	13.878
	8220.0	19.36	7.356	4.593	63.874	57.147	2.408	135.919	0.946	2.384	41.465	18.771	-35.421	16.373	11.999
	8230.0	17.17	7.351	4.569	63.558	56.642	2.436	145.779	0.944	2.252	41.467	13.878	-46.515	14.453	10.421
	8240.0	16.57	7.348	4.551	63.337	56.292	2.455	155.639	0.942	2.116	41.468	9.023	-59.823	12.938	9.226
	8250.0	15.84	7.346	4.541	63.224	56.076	2.465	165.499	0.941	1.976	41.468	4.205	-75.295	11.979	8.497
	8260.0	15.64	7.345	4.538	63.208	56.000	2.467	175.359	0.940	1.000	41.468	-0.582	-267.939	11.704	8.293
	8270.0	15.97	7.346	4.540	63.307	56.039	2.459	185.219	0.941	0.991	41.468	-5.339	251.475	12.147	8.623
	8280.0	16.80	7.348	4.549	63.519	56.192	2.441	195.079	0.942	0.968	41.467	-10.073	236.740	13.224	9.447
	8290.0	18.04	7.351	4.564	63.820	56.482	2.415	204.939	0.944	0.933	41.465	-14.789	224.279	14.784	10.688
8181	8290.0	23.30	7.366	4.645	65.257	58.079	2.291	116.498	0.954	2.633	41.458	28.584	-18.496	20.916	15.937
267	8260.0	21.20	7.358	4.605	64.785	57.208	2.334	126.358	0.950	2.512	41.461	23.612	-26.334	18.529	13.839
	8270.0	19.32	7.352	4.573	64.366	56.533	2.370	136.218	0.946	2.384	41.463	18.681	-35.600	16.333	11.966
	8280.0	17.74	7.347	4.548	64.074	56.030	2.398	146.078	0.943	2.252	41.464	13.791	-46.727	14.420	10.394
	8290.0	16.55	7.344	4.531	63.856	55.682	2.417	155.938	0.942	2.115	41.466	8.939	-60.072	12.914	9.207
	8300.0	15.83	7.342	4.521	63.740	55.473	2.428	165.798	0.940	1.976	41.466	4.122	-75.576	11.966	8.488
	8310.0	15.63	7.342	4.517	63.732	55.393	2.429	175.658	0.940	1.000	41.466	-0.663	267.651	11.703	8.292
	8320.0	15.97	7.342	4.520	63.830	55.436	2.421	185.518	0.941	0.991	41.466	-5.420	251.208	12.158	8.632
	8330.0	16.81	7.344	4.529	64.040	55.597	2.403	195.378	0.942	0.968	41.465	-10.154	236.503	13.245	9.464
	8340.0	18.06	7.347	4.545	64.345	55.879	2.377	205.238	0.944	0.932	41.463	-14.870	224.080	14.812	10.711
8231	8300.0	23.26	7.362	4.626	65.760	57.449	2.253	116.797	0.953	2.635	41.456	28.486	-18.634	20.866	15.893
217	8310.0	21.15	7.354	4.585	65.292	56.579	2.296	126.657	0.949	2.513	41.459	23.518	-26.490	18.484	13.799
	8320.0	19.26	7.348	4.553	64.897	55.906	2.332	136.517	0.946	2.385	41.461	18.591	-35.782	16.294	11.933
	8330.0	17.11	7.344	4.528	64.584	55.405	2.360	146.377	0.943	2.252	41.462	13.704	-46.941	14.387	10.368
	8340.0	16.53	7.340	4.511	64.373	55.059	2.380	156.237	0.941	2.115	41.463	8.854	-60.323	12.890	9.189
	8350.0	15.82	7.338	4.501	64.260	54.853	2.390	166.097	0.940	1.975	41.464	4.039	-75.857	11.953	8.478
	8360.0	15.63	7.338	4.497	64.256	54.771	2.391	175.957	0.940	1.000	41.464	-0.744	267.362	11.703	8.292
	8370.0	15.98	7.338	4.501	64.346	54.827	2.384	185.817	0.940	0.991	41.464	-5.502	250.933	12.170	8.641
	8380.0	16.82	7.340	4.510	64.562	54.978	2.365	195.677	0.942	0.967	41.463	-10.235	236.265	13.266	9.481
	8390.0	18.06	7.342	4.525	64.876	55.256	2.338	205.537	0.944	0.931	41.461	-14.952	223.881	14.841	10.735
8281	8350.0	23.21	7.355	4.506	66.261	56.804	2.216	117.096	0.953	2.636	41.454	28.389	-18.772	20.817	15.849
167	8360.0	21.11	7.351	4.506	65.797	55.937	2.260	126.956	0.949	2.513	41.457	23.425	-26.647	18.439	13.760
	8370.0	19.24	7.345	4.533	65.407	55.266	2.296	136.817	0.946	2.385	41.459	18.501	-35.966	16.254	11.900
	8380.0	17.68	7.340	4.508	65.101	54.763	2.324	146.677	0.943	2.252	41.460	13.616	-47.158	14.354	10.341
	8390.0	16.51	7.337	4.491	64.889	54.425	2.343	156.536	0.941	2.115	41.461	8.769	-60.577	12.866	9.170
	8400.0	15.80	7.335	4.481	64.779	54.220	2.354	166.396	0.940	1.975	41.462	3.955	-76.142	11.941	8.469
	8410.0	15.63	7.334	4.478	64.779	54.136	2.354	176.256	0.940	1.000	41.462	-0.827	267.070	11.703	8.292
	8420.0	15.98	7.335	4.481	64.876	54.167	2.346	186.116	0.940	0.990	41.461	-5.583	250.662	12.182	8.650
	8430.0	16.83	7.337	4.491	65.083	54.357	2.328	195.976	0.942	0.967	41.460	-10.318	236.026	13.288	9.498
	8440.0	18.10	7.340	4.507	65.396	54.630	2.301	205.836	0.944	0.931	41.459	-15.035	223.678	14.870	10.758
8331	8400.0	23.16	7.355	4.508	66.760	56.145	2.180	117.396	0.953	2.637	41.452	28.291	-18.912	20.767	15.805
117	8410.0	21.07	7.347	4.547	66.301	55.260	2.223	127.256	0.949	2.514	41.455	23.330	-26.806	18.354	13.721
	8420.0	19.21	7.341	4.514	65.915	54.612	2.260	137.116	0.945	2.386	41.457	18.410	-36.151	16.214	11.866
	8430.0	17.65	7.336	4.490	65.613	54.114	2.288	146.976	0.943	2.252	41.458	13.528	-47.377	14.321	10.315
	8440.0	16.49	7.333	4.472	65.404	53.777	2.307	156.836	0.941	2.115	41.459	8.683	-60.834	12.842	9.152
	8450.0	15.79	7.331	4.462	65.276	53.575	2.318	166.696	0.940	1.974	41.460	3.871	-76.425	11.928	8.460
	8460.0	15.62	7.331	4.459	65.242	53.500	2.319	176.556	0.940	1.000	41.460	-0.911	266.772	11.703	8.292
	8470.0	15.94	7.331	4.463	65.328	53.542	2.310	186.416	0.940	0.990	41.459	-5.666	250.387	12.194	8.659
	8480.0	16.80	7.333	4.473	65.634	53.708	2.292	196.276	0.941	0.966	41.458	-10.400	235.786	13.311	9.515
	8490.0	18.12	7.336	4.489	65.916	53.990	2.265	206.136	0.944	0.930	41.457	-15.118	223.475	14.900	10.783
ECATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

ECATE	TIME	CV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
8381	8450.0	23.11	7.352	4.570	67.258	55.472	2.144	117.695	0.953	2.638	41.451	28.192	-19.053	20.718	15.761
67	8460.0	21.03	7.344	4.529	66.804	54.610	2.188	127.555	0.949	2.515	41.453	23.235	-26.967	18.349	13.682
	8470.0	19.17	7.338	4.496	66.422	53.945	2.225	137.415	0.945	2.386	41.455	18.318	-36.338	16.174	11.833
	8480.0	17.62	7.333	4.471	66.123	53.454	2.253	147.275	0.943	2.252	41.456	13.439	-47.599	14.288	10.289
	8490.0	16.46	7.330	4.454	65.917	53.116	2.272	157.135	0.941	2.114	41.457	8.596	-61.053	12.819	9.134
	8500.0	15.78	7.328	4.444	65.812	52.916	2.282	166.995	0.940	1.973	41.458	3.786	-76.719	11.916	8.450
	8510.0	15.62	7.327	4.441	65.810	52.843	2.283	176.855	0.939	1.000	41.458	-0.994	-266.475	11.704	8.293
	8520.0	16.00	7.328	4.444	65.920	52.882	2.274	186.715	0.940	0.990	41.457	-5.749	-250.111	12.207	8.668
	8530.0	16.86	7.330	4.455	66.125	53.051	2.256	196.575	0.941	0.966	41.456	-10.484	-235.546	13.333	9.533
	8540.0	18.14	7.333	4.472	66.443	53.325	2.228	206.435	0.943	0.929	41.455	-15.202	-223.274	14.930	10.807
8431	8550.0	23.06	7.348	4.552	67.755	54.783	2.109	117.994	0.952	2.639	41.449	28.094	-19.195	20.668	15.716
17	8510.0	20.98	7.340	4.511	67.305	53.925	2.154	127.854	0.948	2.515	41.451	23.140	-27.128	18.303	13.643
	8520.0	19.13	7.334	4.478	66.927	53.264	2.190	137.714	0.945	2.386	41.453	18.226	-36.527	16.134	11.800
	8530.0	17.59	7.330	4.453	66.632	52.777	2.218	147.574	0.942	2.252	41.454	13.350	-47.822	14.255	10.262
	8540.0	16.44	7.326	4.436	66.429	52.442	2.238	157.434	0.940	2.114	41.455	8.509	-61.355	12.755	9.116
	8550.0	15.77	7.325	4.426	66.326	52.245	2.248	167.294	0.939	1.973	41.456	3.700	-77.011	11.904	8.442
	8560.0	15.62	7.324	4.423	66.327	52.173	2.249	177.154	0.939	1.000	41.456	-1.079	-266.176	11.705	8.294
	8570.0	16.00	7.325	4.427	66.433	52.220	2.240	187.014	0.940	0.989	41.456	-5.833	-249.831	12.220	8.678
	8580.0	16.88	7.327	4.438	66.646	52.379	2.221	196.874	0.941	0.965	41.455	-10.568	-235.568	13.356	9.551
	8590.0	18.16	7.330	4.455	66.955	52.664	2.193	206.734	0.943	0.928	41.453	-15.287	-223.068	14.961	10.832
8481	8550.0	23.02	7.345	4.535	68.249	54.078	2.075	118.293	0.952	2.640	41.447	27.995	-19.338	20.618	15.672
33	8560.0	20.94	7.337	4.494	67.804	53.225	2.120	128.153	0.948	2.516	41.449	23.045	-27.292	18.258	13.603
	8570.0	19.19	7.331	4.461	67.430	52.569	2.156	138.013	0.945	2.387	41.451	18.134	-36.718	16.094	11.766
	8580.0	17.56	7.326	4.436	67.139	52.086	2.185	147.873	0.942	2.252	41.453	13.260	-48.048	14.223	10.236
	8590.0	16.42	7.323	4.419	66.939	51.755	2.204	157.733	0.940	2.114	41.454	8.421	-61.619	12.772	9.098
	8600.0	15.75	7.321	4.409	66.839	51.560	2.214	167.593	0.939	1.972	41.454	3.614	-77.306	11.852	8.433
	8610.0	15.62	7.321	4.406	66.841	51.490	2.215	177.453	0.939	1.000	41.454	-1.164	-265.874	11.706	8.294
	8620.0	16.01	7.322	4.410	66.949	51.537	2.205	187.313	0.940	0.989	41.454	-5.918	-249.550	12.234	8.689
	8630.0	16.89	7.324	4.421	67.166	51.692	2.186	197.173	0.941	0.965	41.453	-10.652	-235.062	13.380	9.569
	8640.0	18.18	7.327	4.439	67.474	51.977	2.159	207.033	0.943	0.928	41.451	-15.373	-222.863	14.952	10.857
8531	8650.0	22.97	7.342	4.519	68.742	53.358	2.042	118.592	0.952	2.641	41.445	27.895	-19.482	20.568	15.628
83	8610.0	20.90	7.334	4.477	68.301	52.510	2.086	128.452	0.948	2.517	41.448	22.949	-27.456	18.212	13.564
	8620.0	19.06	7.328	4.444	67.932	51.860	2.123	138.312	0.945	2.387	41.449	18.041	-36.910	16.054	11.733
	8630.0	17.53	7.323	4.419	67.644	51.381	2.151	148.172	0.942	2.252	41.451	13.169	-48.276	14.190	10.210
	8640.0	16.47	7.320	4.402	67.448	51.054	2.171	158.032	0.940	2.113	41.452	8.333	-61.886	12.748	9.080
	8650.0	15.74	7.318	4.392	67.350	50.862	2.181	167.892	0.939	1.971	41.452	3.528	-77.604	11.861	8.424
	8660.0	15.61	7.318	4.390	67.355	50.793	2.181	177.752	0.939	1.000	41.452	-1.250	-265.571	11.707	8.296
	8670.0	16.02	7.319	4.394	67.463	50.841	2.172	187.612	0.939	0.989	41.452	-6.003	-249.269	12.248	8.699
	8680.0	16.91	7.321	4.405	67.675	51.003	2.153	197.472	0.941	0.964	41.451	-10.738	-234.816	13.404	9.588
	8690.0	18.21	7.324	4.423	67.992	51.275	2.125	207.332	0.943	0.927	41.450	-15.459	-222.658	15.023	10.883
ECATE	TIME	CV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	CV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
8265	8340.0	21.87	7.355	4.586	65.795	56.443	2.256	123.240	0.951	2.559	41.456	25.273	-23.561	19.309	14.517
183	8350.0	19.91	7.348	4.550	65.375	55.702	2.295	133.100	0.947	2.433	41.459	20.333	-32.294	17.042	12.563
	8360.0	18.22	7.343	4.523	65.036	55.142	2.326	142.960	0.944	2.302	41.460	15.434	-42.735	15.023	10.882
	8370.0	16.90	7.339	4.503	64.788	54.743	2.349	152.820	0.942	2.166	41.462	10.572	-55.305	13.364	9.557
	8380.0	16.01	7.337	4.490	64.638	54.488	2.363	162.680	0.940	2.027	41.462	5.746	-70.127	12.211	8.672
	8390.0	15.63	7.335	4.484	64.602	54.355	2.367	172.540	0.940	1.885	41.463	0.953	-86.623	11.707	8.295
	8400.0	15.79	7.336	4.485	64.656	54.364	2.362	182.400	0.940	0.995	41.462	-3.813	-256.628	11.924	8.456
	8410.0	16.47	7.337	4.493	64.824	54.484	2.348	192.260	0.941	0.977	41.462	-8.555	-241.223	12.812	9.129
	8420.0	17.59	7.340	4.506	65.093	54.719	2.324	202.120	0.943	0.946	41.460	-13.278	-228.016	14.236	10.246
	8430.0	19.06	7.343	4.526	65.475	55.076	2.292	211.980	0.945	0.902	41.458	-17.987	-217.042	16.039	11.720
8298	8370.0	22.62	7.355	4.588	66.305	56.326	2.216	119.822	0.952	2.604	41.454	27.031	-20.798	20.153	15.260
150	8380.0	20.58	7.348	4.550	65.861	55.514	2.257	129.682	0.948	2.480	41.457	22.079	-29.024	17.821	13.227
	8390.0	18.78	7.342	4.519	65.493	54.892	2.291	139.542	0.945	2.351	41.458	17.167	-38.808	15.703	11.441
	8400.0	17.32	7.338	4.497	65.213	54.439	2.317	149.402	0.942	2.216	41.460	12.293	-50.580	13.901	9.980
	8410.0	16.26	7.335	4.481	65.029	54.134	2.334	159.262	0.941	2.078	41.461	7.456	-64.619	12.552	8.930
	8420.0	15.70	7.333	4.473	64.947	53.965	2.342	169.122	0.940	1.937	41.461	2.652	-80.648	11.804	8.367
	8430.0	15.67	7.333	4.471	64.975	53.916	2.340	178.982	0.940	0.999	41.461	-2.123	-262.459	11.763	8.337
	8440.0	16.17	7.334	4.477	65.101	53.998	2.330	188.842	0.940	0.985	41.461	-6.873	-246.467	12.426	8.834
	8450.0	17.14	7.336	4.488	65.337	54.192	2.309	198.702	0.942	0.958	41.459	-11.602	-232.438	13.678	9.803
	8460.0	18.53	7.340	4.506	65.676	54.505	2.280	208.562	0.944	0.919	41.458	-16.316	-220.700	15.363	11.161
8348	8420.0	22.57	7.352	4.570	66.805	55.663	2.180	120.121	0.952	2.605	41.452	26.934	-20.942	20.104	15.217
100	8430.0	20.53	7.344	4.531	66.366	54.834	2.222	129.981	0.948	2.481	41.455	21.985	-29.190	17.777	13.190
	8440.0	18.75	7.338	4.501	66.002	54.235	2.256	139.841	0.945	2.351	41.456	17.076	-39.002	15.665	11.410
	8450.0	17.29	7.334	4.478	65.725	53.784	2.282	149.701	0.942	2.216	41.458	12.205	-50.810	13.871	9.956
	8460.0	16.24	7.331	4.462	65.544	53.483	2.299	159.562	0.940	2.077	41.459	7.370	-64.887	12.531	8.914
	8470.0	15.69	7.330	4.454	65.464	53.316	2.307	169.422	0.940	1.936	41.459	2.567	-80.941	11.755	8.360
	8480.0	15.67	7.330	4.453	65.487	53.274	2.305	179.281	0.940	0.998	41.459	-2.207	-262.204	11.767	8.340
	8490.0	16.18	7.331	4.458	65.623	53.344	2.294	189.141	0.940	0.985	41.459	-6.956	-246.200	12.441	8.846
	8500.0	17.16	7.332	4.470	65.858	53.545	2.273	199.001	0.942	0.958	41.457	-11.685	-232.208	13.702	9.822
	8510.0	18.52	7.336	4.489	66.196	53.860	2.243	208.861	0.944	0.918	41.456	-16.400	-220.506	15.194	11.187
8398	8470.0	22.52	7.348	4.557	67.304	54.985	2.145	120.421	0.951	2.606	41.451	26.836	-21.088	20.056	15.174
50	8480.0	20.49	7.341	4.513	66.869	54.179	2.187	130.281	0.948	2.481	41.453	21.891	-29.357	17.733	13.152
	8490.0	18.71	7.335	4.482	66.509	53.564	2.221	140.141	0.944	2.351	41.455	16.985	-39.199	15.627	11.378
	8500.0	17.26	7.331	4.460	66.236	53.117	2.247	150.001	0.942	2.216	41.456	12.117	-51.042	13.840	9.931
	8510.0	16.23	7.328	4.444	66.057	52.818	2.264	159.861	0.940	2.077	41.457	7.284	-65.156	12.510	8.898
	8520.0	15.68	7.326	4.436	65.980	52.654	2.271	169.721	0.939	1.935	41.457	2.483	-81.236	11.786	8.354
	8530.0	15.67	7.326	4.435	66.007	52.613	2.270	179.581	0.939	0.998	41.457	-2.290	-261.909	11.771	8.343
	8540.0	16.18	7.327	4.441	66.145	52.665	2.258	189.441	0.940	0.985	41.457	-7.039	-245.932	12.477	8.858
	8550.0	17.17	7.330	4.453	66.379	52.884	2.238	199.301	0.942	0.957	41.455	-11.769	-231.977	13.727	9.842
	8560.0	18.55	7.333	4.472	66.715	53.199	2.208	209.161	0.944	0.917	41.454	-16.485	-220.311	15.426	11.213
8448	8520.0	22.48	7.345	4.535	67.801	54.291	2.110	120.720	0.951	2.607	41.449	26.738	-21.235	20.007	15.131
0	8530.0	20.45	7.338	4.496	67.370	53.490	2.152	130.580	0.947	2.482	41.451	21.797	-29.526	17.689	13.114
	8540.0	18.68	7.332	4.465	67.015	52.880	2.187	140.440	0.944	2.351	41.453	16.894	-39.397	15.588	11.346
	8550.0	17.23	7.328	4.442	66.745	52.436	2.213	150.300	0.942	2.216	41.454	12.028	-51.277	13.810	9.907
	8560.0	16.21	7.325	4.427	66.569	52.140	2.230	160.160	0.940	2.077	41.455	7.197	-65.425	12.489	8.882
	8570.0	15.67	7.322	4.419	66.494	51.978	2.237	170.020	0.939	1.934	41.455	2.397	-81.534	11.777	8.347
	8580.0	15.67	7.322	4.418	66.523	51.939	2.235	179.880	0.939	0.998	41.455	-2.375	-261.611	11.776	8.346
	8590.0	16.19	7.324	4.423	66.666	52.006	2.223	189.740	0.940	0.984	41.455	-7.123	-245.663	12.473	8.870
	8600.0	17.17	7.326	4.436	66.899	52.207	2.203	199.600	0.942	0.956	41.454	-11.853	-231.746	13.753	9.862
	8610.0	18.57	7.330	4.455	67.234	52.523	2.172	209.460	0.944	0.916	41.452	-16.570	-220.116	15.458	11.239
ECATE	TTIME	CV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

ECATE	TTIME	CV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
8498	8570.0	22.43	7.342	4.518	68.296	53.583	2.076	121.019	0.951	2.608	41.447	26.640	-21.383	19.958	15.088
317	8570.0	20.41	7.334	4.479	67.870	52.787	2.119	130.879	0.947	2.482	41.449	21.702	-25.697	17.644	13.076
	8570.0	18.64	7.324	4.448	67.519	52.181	2.153	140.739	0.944	2.351	41.451	16.802	-39.597	15.550	11.315
	8600.0	17.21	7.324	4.425	67.252	51.742	2.179	150.599	0.942	2.216	41.452	11.939	-51.514	13.779	9.883
	8610.0	16.17	7.322	4.410	67.080	51.449	2.196	160.459	0.940	2.076	41.453	7.109	-65.704	12.469	8.867
	8620.0	15.66	7.320	4.402	67.007	51.289	2.203	170.319	0.939	1.934	41.454	2.311	-81.835	11.769	8.341
	8630.0	15.67	7.320	4.401	67.038	51.251	2.201	180.179	0.939	0.998	41.454	-2.460	-261.312	11.780	8.350
	8640.0	16.20	7.321	4.407	67.174	51.330	2.190	190.039	0.940	0.984	41.453	-7.209	-245.388	12.490	8.883
	8650.0	17.21	7.322	4.420	67.418	51.515	2.168	199.899	0.941	0.956	41.452	-11.938	-231.514	13.778	9.883
	8660.0	18.59	7.327	4.439	67.772	51.831	2.138	209.759	0.944	0.915	41.450	-16.656	-219.920	15.451	11.266
8548	8620.0	22.38	7.335	4.501	68.789	52.859	2.043	121.318	0.951	2.608	41.445	26.542	-21.533	19.909	15.045
267	8630.0	20.37	7.331	4.462	68.368	52.066	2.086	131.178	0.947	2.483	41.448	21.607	-29.868	17.600	13.038
	8640.0	18.61	7.326	4.431	68.021	51.468	2.120	141.038	0.944	2.351	41.449	16.710	-39.799	15.512	11.283
	8650.0	17.18	7.321	4.408	67.758	51.033	2.146	150.898	0.941	2.215	41.451	11.849	-51.753	13.748	9.859
	8660.0	16.17	7.315	4.393	67.588	50.744	2.163	160.758	0.940	2.076	41.451	7.021	-65.981	12.448	8.851
	8670.0	15.65	7.317	4.385	67.518	50.587	2.170	170.618	0.939	1.933	41.452	2.224	-82.138	11.761	8.335
	8680.0	15.67	7.317	4.385	67.551	50.550	2.168	180.478	0.939	0.998	41.452	-2.546	-261.011	11.765	8.353
	8690.0	16.21	7.318	4.391	67.688	50.629	2.156	190.338	0.940	0.983	41.451	-7.294	-245.116	12.507	8.895
	8700.0	17.22	7.321	4.404	67.927	50.821	2.135	200.198	0.941	0.955	41.450	-12.025	-231.278	13.805	9.904
	8710.0	18.62	7.324	4.424	68.270	51.123	2.104	210.058	0.944	0.915	41.448	-16.743	-219.724	15.524	11.294
8598	8670.0	22.34	7.336	4.486	69.281	52.118	2.011	121.617	0.951	2.609	41.444	26.443	-21.683	19.850	15.002
217	8680.0	20.33	7.328	4.446	68.864	51.334	2.053	131.477	0.947	2.483	41.446	21.511	-30.042	17.556	13.000
	8690.0	18.57	7.322	4.415	68.521	50.740	2.088	141.337	0.944	2.351	41.448	16.617	-40.003	15.473	11.252
	8700.0	17.15	7.318	4.392	68.267	50.311	2.114	151.197	0.941	2.215	41.449	11.758	-51.995	13.718	9.835
	8710.0	16.15	7.316	4.377	68.095	50.026	2.131	161.057	0.940	2.075	41.450	6.933	-66.261	12.428	8.836
	8720.0	15.64	7.314	4.369	68.028	49.871	2.138	170.917	0.939	1.932	41.450	2.137	-82.443	11.753	8.330
	8730.0	15.67	7.314	4.369	68.062	49.835	2.136	180.777	0.939	0.998	41.450	-2.632	-260.709	11.751	8.357
	8740.0	16.22	7.315	4.375	68.290	49.914	2.124	190.637	0.940	0.983	41.449	-7.380	-244.841	12.524	8.909
	8750.0	17.24	7.318	4.389	68.440	50.105	2.102	200.497	0.941	0.955	41.448	-12.111	-231.044	13.822	9.925
	8760.0	18.64	7.322	4.409	68.777	50.413	2.071	210.357	0.944	0.914	41.447	-16.831	-219.525	15.558	11.321
8648	8720.0	22.29	7.333	4.470	69.771	51.362	1.979	121.917	0.950	2.610	41.442	26.343	-21.835	19.811	14.959
167	8730.0	20.29	7.325	4.431	69.359	50.586	2.022	131.776	0.947	2.483	41.444	21.415	-30.217	17.511	12.963
	8740.0	18.54	7.320	4.400	69.020	49.998	2.056	141.636	0.943	2.351	41.446	16.524	-40.209	15.435	11.220
	8750.0	17.13	7.316	4.377	68.764	49.574	2.083	151.496	0.941	2.215	41.447	11.667	-52.239	13.687	9.811
	8760.0	16.13	7.313	4.362	68.601	49.293	2.099	161.356	0.939	2.074	41.448	6.844	-66.544	12.468	8.820
	8770.0	15.64	7.311	4.354	68.535	49.141	2.107	171.216	0.939	1.931	41.449	2.049	-82.750	11.746	8.324
	8780.0	15.67	7.311	4.354	68.572	49.106	2.104	181.076	0.939	0.998	41.448	-2.719	-260.404	11.757	8.362
	8790.0	16.23	7.313	4.360	68.711	49.184	2.092	190.937	0.939	0.983	41.448	-7.467	-244.566	12.542	8.922
	8800.0	17.26	7.315	4.374	68.951	49.374	2.070	200.797	0.941	0.954	41.447	-12.198	-230.808	13.859	9.946
	8810.0	18.67	7.319	4.395	69.288	49.679	2.039	210.656	0.944	0.913	41.445	-16.919	-219.327	15.552	11.350
8698	8770.0	22.25	7.330	4.455	70.259	50.589	1.948	122.216	0.950	2.610	41.441	26.244	-21.988	19.762	14.915
117	8780.0	20.25	7.323	4.416	69.851	49.821	1.991	132.076	0.946	2.484	41.443	21.318	-30.393	17.467	12.925
	8790.0	18.51	7.317	4.385	69.516	49.241	2.026	141.936	0.943	2.351	41.445	16.430	-40.416	15.397	11.188
	8800.0	17.10	7.317	4.362	69.265	48.823	2.052	151.796	0.941	2.214	41.446	11.576	-52.485	13.657	9.787
	8810.0	16.12	7.310	4.347	69.104	48.547	2.068	161.656	0.939	2.074	41.447	6.754	-66.825	12.368	8.805
	8820.0	15.63	7.305	4.339	69.041	48.397	2.076	171.516	0.938	1.930	41.447	1.961	-83.060	11.739	8.319
	8830.0	15.68	7.305	4.339	69.080	48.364	2.073	181.376	0.938	0.998	41.447	-2.807	-260.098	11.803	8.366
	8840.0	16.25	7.310	4.346	69.220	48.441	2.061	191.236	0.939	0.982	41.446	-7.554	-244.289	12.560	8.936
	8850.0	17.28	7.313	4.360	69.460	48.628	2.038	201.096	0.941	0.953	41.445	-12.286	-230.571	13.886	9.968
	8860.0	18.69	7.316	4.381	69.796	48.930	2.007	210.956	0.943	0.912	41.444	-17.007	-219.128	15.626	11.378
ECATE	TTIME	CV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	CV SUM	DV2	VINF2	PHI2	ALPHA2	VFL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
8748	8820.0	22.20	7.327	4.441	70.744	49.800	1.917	122.515	0.950	2.611	41.439	26.143	-22.142	19.713	14.872
67	8830.0	20.21	7.320	4.401	70.342	49.041	1.961	132.375	0.946	2.484	41.441	21.222	-30.571	17.422	12.887
	8840.0	18.47	7.314	4.370	70.011	48.469	1.996	142.235	0.943	2.351	41.443	16.336	-40.626	15.358	11.157
	8850.0	17.07	7.310	4.347	69.763	48.057	2.022	152.095	0.941	2.214	41.444	11.484	-52.734	13.627	9.763
	8860.0	16.10	7.307	4.332	69.606	47.785	2.038	161.955	0.939	2.073	41.445	6.664	-67.117	12.368	8.790
	8870.0	15.62	7.306	4.325	69.545	47.639	2.045	171.815	0.938	1.929	41.446	1.872	-83.373	11.732	8.314
	8880.0	15.68	7.306	4.325	69.585	47.606	2.043	181.675	0.938	0.997	41.445	-2.895	-255.790	11.809	8.371
	8890.0	16.26	7.307	4.332	69.726	47.683	2.030	191.535	0.939	0.982	41.445	-7.642	-244.012	12.578	8.950
	8900.0	17.30	7.310	4.346	69.967	47.868	2.008	201.395	0.941	0.953	41.444	-12.375	-230.334	13.914	9.990
	8910.0	18.72	7.314	4.368	70.303	48.166	1.976	211.255	0.943	0.911	41.442	-17.097	-218.928	15.661	11.407
8798	8810.0	22.15	7.325	4.427	71.228	48.993	1.888	122.814	0.950	2.612	41.438	26.043	-22.297	19.663	14.829
17	8820.0	20.17	7.317	4.387	70.830	48.245	1.931	132.674	0.946	2.484	41.440	21.124	-30.750	17.378	12.849
	8830.0	18.44	7.312	4.356	70.504	47.681	1.966	142.534	0.943	2.351	41.442	16.241	-40.838	15.320	11.125
	8840.0	17.05	7.308	4.333	70.259	47.275	1.992	152.394	0.940	2.214	41.443	11.392	-52.984	13.566	9.739
	8850.0	16.08	7.305	4.318	70.105	47.010	2.009	162.254	0.939	2.072	41.444	6.573	-67.407	12.349	8.776
	8860.0	15.61	7.304	4.311	70.047	46.866	2.016	172.114	0.938	1.928	41.444	1.783	-83.687	11.725	8.309
	8870.0	15.68	7.304	4.311	70.089	46.835	2.013	181.974	0.938	0.997	41.444	-2.984	-255.480	11.816	8.376
	8880.0	16.27	7.305	4.318	70.231	46.917	2.005	191.834	0.939	0.981	41.443	-7.731	-243.733	12.597	8.964
	8890.0	17.32	7.308	4.333	70.472	47.092	1.977	201.694	0.941	0.952	41.442	-12.464	-230.096	13.942	10.013
	8900.0	18.75	7.312	4.355	70.808	47.385	1.945	211.554	0.943	0.910	41.441	-17.187	-218.728	15.697	11.436
8848	8920.0	22.11	7.322	4.413	71.710	48.170	1.859	123.113	0.950	2.612	41.437	25.942	-22.453	19.614	14.785
33	8930.0	20.13	7.315	4.374	71.317	47.432	1.902	132.973	0.946	2.484	41.439	21.027	-30.931	17.333	12.811
	8940.0	18.40	7.309	4.342	70.995	46.878	1.937	142.833	0.943	2.351	41.440	16.146	-41.051	15.281	11.094
	8950.0	17.02	7.305	4.317	70.754	46.481	1.963	152.693	0.940	2.213	41.442	11.299	-53.237	13.566	9.715
	8960.0	16.06	7.302	4.304	70.603	46.220	1.980	162.553	0.939	2.071	41.442	6.482	-67.700	12.329	8.761
	8970.0	15.61	7.301	4.297	70.547	46.079	1.987	172.413	0.938	1.927	41.443	1.693	-84.004	11.719	8.304
	8980.0	15.68	7.301	4.297	70.591	46.048	1.984	182.273	0.938	0.997	41.443	-3.073	-255.169	11.823	8.382
	8990.0	16.28	7.302	4.305	70.734	46.123	1.971	192.133	0.939	0.981	41.442	-7.820	-243.453	12.617	8.979
	9000.0	17.34	7.305	4.320	70.975	46.301	1.948	201.993	0.941	0.951	41.441	-12.553	-229.858	13.971	10.035
	9010.0	18.77	7.305	4.343	71.310	46.589	1.916	211.853	0.943	0.909	41.439	-17.277	-218.528	15.732	11.465
8898	8970.0	22.06	7.320	4.400	72.189	47.320	1.831	123.412	0.949	2.613	41.435	25.841	-22.611	19.565	14.742
83	8980.0	20.04	7.313	4.360	71.801	46.604	1.874	133.272	0.946	2.484	41.437	20.928	-31.113	17.289	12.772
	8990.0	18.37	7.307	4.329	71.463	46.060	1.909	143.132	0.942	2.351	41.439	16.051	-41.266	15.243	11.062
	9000.0	16.94	7.302	4.306	71.246	45.671	1.935	152.992	0.940	2.212	41.440	11.205	-53.493	13.536	9.692
	9010.0	16.05	7.300	4.291	71.098	45.415	1.952	162.852	0.939	2.071	41.441	6.390	-67.995	12.310	8.746
	9020.0	15.60	7.299	4.284	71.045	45.277	1.959	172.712	0.938	1.926	41.441	1.602	-84.322	11.712	8.299
	9030.0	15.69	7.295	4.285	71.090	45.248	1.955	182.572	0.938	0.997	41.441	-3.163	-258.856	11.831	8.387
	9040.0	16.29	7.300	4.293	71.234	45.320	1.942	192.432	0.939	0.980	41.441	-7.910	-243.172	12.636	8.994
	9050.0	17.36	7.303	4.308	71.476	45.495	1.919	202.292	0.941	0.951	41.439	-12.643	-229.618	14.000	10.058
	9060.0	18.80	7.307	4.331	71.810	45.777	1.887	212.152	0.943	0.908	41.438	-17.369	-218.326	15.768	11.495
ECATE	TTIME	CV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

ECATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
8632	8700.0	23.09	7.337	4.491	69.798	51.937	1.971	118.200	0.952	2.655	41.442	28.195	-19.032	20.713	15.756
183	8710.0	21.61	7.329	4.444	69.342	51.094	2.017	128.060	0.948	2.530	41.444	23.251	-26.922	18.349	13.683
	8720.0	19.16	7.322	4.415	68.973	50.438	2.055	137.920	0.945	2.400	41.446	18.345	-36.263	16.179	11.836
	8730.0	17.61	7.318	4.389	68.684	49.955	2.084	147.780	0.942	2.265	41.447	13.476	-47.488	14.253	10.293
	8740.0	16.45	7.315	4.371	68.485	49.622	2.104	157.640	0.940	2.126	41.448	8.640	-60.946	12.821	9.136
	8750.0	15.76	7.313	4.361	68.382	49.423	2.115	167.500	0.939	1.984	41.449	3.835	-76.545	11.913	8.448
	8760.0	15.60	7.312	4.358	68.381	49.346	2.116	177.360	0.939	1.000	41.449	-0.943	-266.655	11.693	8.285
	8770.0	15.97	7.313	4.362	68.482	49.383	2.108	187.220	0.939	0.990	41.449	-5.698	-250.268	12.189	8.655
	8780.0	16.83	7.315	4.373	68.685	49.531	2.089	197.080	0.940	0.966	41.448	-10.435	-235.670	13.511	9.515
	8790.0	18.11	7.318	4.391	68.987	49.794	2.062	206.940	0.943	0.930	41.446	-15.158	-223.359	14.906	10.788
8666	8740.0	21.72	7.330	4.454	69.825	50.870	1.980	124.642	0.949	2.577	41.442	24.995	-23.986	19.166	14.392
150	8750.0	19.78	7.323	4.416	69.432	50.149	2.021	134.502	0.946	2.449	41.444	20.077	-32.762	16.919	12.459
	8760.0	18.12	7.318	4.388	69.116	49.610	2.054	144.362	0.943	2.315	41.446	15.197	-43.268	14.920	10.799
	8770.0	16.81	7.314	4.367	68.885	49.228	2.077	154.222	0.940	2.178	41.447	10.350	-55.910	13.286	9.496
	8780.0	15.94	7.311	4.354	68.749	48.984	2.091	164.082	0.939	2.036	41.448	5.535	-70.806	12.160	8.633
	8790.0	15.59	7.310	4.348	68.711	48.864	2.096	173.942	0.938	1.892	41.448	0.748	-87.345	11.687	8.280
	8800.0	15.77	7.311	4.349	68.775	48.860	2.091	183.802	0.939	0.995	41.448	-4.014	-255.925	11.934	8.464
	8810.0	16.47	7.312	4.358	68.942	48.968	2.076	193.662	0.940	0.976	41.447	-8.757	-240.590	12.850	9.158
	8820.0	17.61	7.315	4.374	69.208	49.186	2.051	203.522	0.942	0.944	41.446	-13.485	-227.462	14.295	10.294
	8830.0	19.11	7.319	4.397	69.569	49.522	2.018	213.382	0.944	0.900	41.444	-18.204	-216.556	16.118	11.786
8716	8790.0	21.68	7.327	4.439	70.313	50.094	1.949	124.942	0.949	2.578	41.441	24.896	-24.144	19.118	14.350
100	8800.0	19.74	7.320	4.402	69.925	49.382	1.990	134.802	0.945	2.449	41.443	19.982	-32.947	16.876	12.422
	8810.0	18.08	7.315	4.373	69.613	48.849	2.023	144.661	0.942	2.315	41.444	15.103	-43.486	14.884	10.769
	8820.0	16.78	7.311	4.352	69.386	48.473	2.047	154.521	0.940	2.177	41.446	10.259	-56.168	13.258	9.474
	8830.0	15.93	7.309	4.339	69.252	48.233	2.061	164.381	0.939	2.035	41.446	5.446	-71.101	12.144	8.621
	8840.0	15.59	7.308	4.333	69.217	48.116	2.065	174.241	0.938	1.891	41.446	0.660	-87.658	11.683	8.278
	8850.0	15.78	7.308	4.335	69.283	48.112	2.060	184.101	0.939	0.995	41.446	-4.102	-255.628	11.944	8.471
	8860.0	16.48	7.310	4.344	69.450	48.219	2.045	193.961	0.940	0.976	41.445	-8.844	-240.323	12.871	9.174
	8870.0	17.63	7.313	4.360	69.717	48.435	2.020	203.822	0.942	0.943	41.444	-13.573	-227.236	14.325	10.318
	8880.0	19.13	7.317	4.383	70.077	48.767	1.986	213.682	0.944	0.899	41.443	-18.293	-216.366	16.154	11.816
8766	8840.0	21.63	7.324	4.425	70.799	49.301	1.919	125.241	0.949	2.578	41.439	24.796	-24.304	19.070	14.308
50	8850.0	19.70	7.318	4.387	70.417	48.598	1.960	135.101	0.945	2.449	41.441	19.885	-33.133	16.833	12.386
	8860.0	18.05	7.312	4.358	70.108	48.074	1.993	144.961	0.942	2.315	41.443	15.010	-43.706	14.847	10.740
	8870.0	16.76	7.308	4.337	69.885	47.703	2.017	154.821	0.940	2.177	41.444	10.167	-56.429	13.230	9.452
	8880.0	15.91	7.306	4.324	69.754	47.468	2.031	164.681	0.939	2.035	41.445	5.356	-71.395	12.127	8.609
	8890.0	15.58	7.305	4.319	69.720	47.353	2.035	174.541	0.938	1.890	41.445	0.571	-87.973	11.680	8.275
	8900.0	15.78	7.305	4.321	69.788	47.350	2.030	184.401	0.938	0.994	41.445	-4.190	-255.326	11.954	8.479
	8910.0	16.50	7.307	4.330	69.956	47.455	2.014	194.261	0.940	0.975	41.444	-8.933	-240.056	12.852	9.191
	8920.0	17.65	7.310	4.347	70.223	47.668	1.989	204.121	0.941	0.942	41.443	-13.662	-227.009	14.355	10.342
	8930.0	19.16	7.314	4.370	70.583	47.996	1.955	213.981	0.944	0.898	41.441	-18.383	-216.175	16.150	11.846
8816	8890.0	21.59	7.322	4.411	71.284	48.492	1.690	125.540	0.949	2.578	41.438	24.697	-24.466	19.021	14.266
0	8900.0	19.66	7.315	4.373	70.905	47.799	1.931	135.400	0.945	2.449	41.440	19.789	-33.320	16.790	12.349
	8910.0	18.02	7.310	4.344	70.601	47.283	1.964	145.260	0.942	2.315	41.442	14.915	-43.929	14.811	10.710
	8920.0	16.74	7.306	4.323	70.381	46.919	1.987	155.120	0.940	2.176	41.443	10.075	-56.691	13.202	9.431
	8930.0	15.90	7.304	4.311	70.253	46.688	2.002	164.980	0.939	2.034	41.443	5.265	-71.698	12.111	8.596
	8940.0	15.58	7.303	4.305	70.222	46.576	2.006	174.840	0.938	1.889	41.444	0.482	-88.290	11.677	8.273
	8950.0	15.79	7.302	4.307	70.291	46.573	2.000	184.700	0.938	0.994	41.443	-4.279	-255.022	11.964	8.486
	8960.0	16.51	7.305	4.317	70.460	46.676	1.985	194.560	0.939	0.975	41.443	-9.022	-239.787	12.914	9.207
	8970.0	17.67	7.308	4.334	70.727	46.886	1.959	204.420	0.941	0.942	41.441	-13.751	-226.781	14.386	10.367
	8980.0	19.19	7.312	4.358	71.086	47.208	1.925	214.280	0.944	0.897	41.440	-18.474	-215.983	16.227	11.877
ECATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMD	VEL1	ALPHA1	PHI1	VINF1	DV1
8866	8940.0	21.54	7.315	4.397	71.766	47.666	1.861	125.839	0.949	2.579	41.437	24.597	-24.628	18.973	14.224
317	8950.0	19.63	7.313	4.360	71.392	46.984	1.903	135.699	0.945	2.449	41.439	19.692	-33.510	16.746	12.313
	8960.0	17.99	7.307	4.331	71.092	46.477	1.935	145.559	0.942	2.315	41.440	14.821	-44.153	14.774	10.680
	8970.0	16.71	7.304	4.310	70.876	46.120	1.959	155.419	0.940	2.175	41.441	9.983	-56.956	13.175	9.409
	8980.0	15.84	7.301	4.297	70.751	45.894	1.973	165.279	0.938	2.033	41.442	5.174	-72.000	12.095	8.584
	8990.0	15.57	7.300	4.292	70.722	45.784	1.977	175.139	0.938	1.888	41.442	0.392	-88.669	11.675	8.271
	9000.0	15.80	7.301	4.294	70.793	45.782	1.971	184.999	0.938	0.994	41.442	-4.368	254.716	11.975	8.494
	9010.0	16.53	7.302	4.304	70.962	45.883	1.950	194.859	0.939	0.974	41.441	-9.111	239.518	12.936	9.225
	9020.0	17.70	7.306	4.321	71.229	46.088	1.930	204.719	0.941	0.941	41.440	-13.841	226.553	14.416	10.391
	9030.0	19.22	7.310	4.346	71.587	46.405	1.895	214.579	0.944	0.896	41.438	-18.565	215.791	16.264	11.908
8916	8940.0	21.50	7.317	4.384	72.246	46.823	1.833	126.138	0.948	2.579	41.436	24.496	-24.792	18.925	14.182
267	9000.0	19.59	7.310	4.347	71.877	46.153	1.875	135.998	0.945	2.449	41.437	19.594	-33.701	16.703	12.277
	9010.0	17.96	7.305	4.318	71.581	45.656	1.908	145.858	0.942	2.314	41.439	14.726	-44.375	14.738	10.651
	9020.0	16.69	7.301	4.297	71.369	45.306	1.931	155.718	0.940	2.175	41.440	9.890	-57.224	13.147	9.388
	9030.0	15.87	7.299	4.284	71.246	45.065	1.945	165.578	0.938	2.032	41.441	5.083	-72.305	12.079	8.582
	9040.0	15.57	7.298	4.279	71.220	44.979	1.949	175.438	0.938	1.887	41.441	0.301	-88.930	11.672	8.270
	9050.0	15.80	7.298	4.282	71.292	44.976	1.943	185.298	0.938	0.994	41.441	-4.458	254.410	11.986	8.503
	9060.0	16.54	7.300	4.292	71.462	45.074	1.927	195.158	0.939	0.974	41.440	-9.201	239.247	12.959	9.242
	9070.0	17.72	7.303	4.309	71.729	45.275	1.901	205.018	0.941	0.940	41.439	-13.932	226.324	14.448	10.417
	9080.0	19.25	7.308	4.334	72.046	45.585	1.866	214.878	0.944	0.895	41.437	-18.656	215.595	16.302	11.940
8966	9040.0	21.45	7.315	4.372	72.724	45.962	1.806	126.437	0.948	2.580	41.434	24.396	-24.957	18.877	14.140
217	9050.0	19.55	7.308	4.334	72.360	45.305	1.848	136.297	0.945	2.449	41.436	19.496	-33.893	16.660	12.240
	9060.0	17.92	7.303	4.305	72.068	44.819	1.880	146.157	0.942	2.314	41.438	14.630	-44.667	14.701	10.621
	9070.0	16.67	7.299	4.284	71.859	44.478	1.904	156.017	0.939	2.174	41.439	9.796	-57.493	13.120	9.367
	9080.0	15.86	7.297	4.272	71.739	44.262	1.916	165.877	0.938	2.031	41.439	4.991	-72.612	12.063	8.561
	9090.0	15.56	7.296	4.261	71.715	44.157	1.922	175.737	0.938	1.885	41.440	0.210	-89.253	11.670	8.268
	9100.0	15.81	7.296	4.270	71.789	44.154	1.916	185.597	0.938	0.994	41.439	-4.549	254.102	11.958	8.511
	9110.0	16.56	7.298	4.280	71.960	44.250	1.899	195.457	0.939	0.973	41.439	-9.292	238.976	12.982	9.260
	9120.0	17.74	7.301	4.298	72.226	44.446	1.873	205.317	0.941	0.939	41.437	-14.023	226.095	14.479	10.442
	9130.0	19.28	7.306	4.323	72.582	44.748	1.838	215.177	0.944	0.894	41.436	-18.749	215.406	16.340	11.972
9016	9040.0	21.41	7.312	4.360	72.200	45.085	1.779	126.736	0.948	2.580	41.433	24.295	-25.124	18.828	14.098
167	9100.0	19.51	7.308	4.322	72.840	44.447	1.821	136.596	0.944	2.449	41.435	19.398	-34.087	16.617	12.204
	9110.0	17.89	7.300	4.293	72.553	43.967	1.854	146.456	0.941	2.314	41.437	14.535	-44.837	14.665	10.592
	9120.0	16.64	7.297	4.272	72.347	43.634	1.878	156.316	0.939	2.173	41.438	9.702	-57.765	13.053	9.346
	9130.0	15.84	7.295	4.260	72.231	43.423	1.891	166.177	0.938	2.030	41.438	4.898	-72.921	12.048	8.549
	9140.0	15.56	7.294	4.255	72.208	43.321	1.895	176.036	0.938	1.884	41.438	0.119	-89.576	11.668	8.267
	9150.0	15.81	7.294	4.258	72.283	43.318	1.889	185.896	0.938	0.993	41.438	-4.640	253.792	12.009	8.520
	9160.0	16.57	7.296	4.268	72.455	43.411	1.872	195.756	0.939	0.973	41.437	-9.383	238.704	13.005	9.278
	9170.0	17.77	7.299	4.287	72.721	43.631	1.846	205.616	0.941	0.939	41.436	-14.115	225.865	14.512	10.468
	9180.0	19.31	7.304	4.312	73.076	43.895	1.810	215.476	0.944	0.893	41.435	-18.842	215.213	16.379	12.004
9066	9140.0	21.37	7.310	4.348	73.673	44.190	1.754	127.036	0.948	2.580	41.432	24.193	-25.291	18.780	14.056
117	9150.0	19.47	7.304	4.310	73.319	43.562	1.795	136.896	0.944	2.449	41.434	19.299	-34.283	16.573	12.167
	9160.0	17.86	7.298	4.281	73.035	43.099	1.828	146.756	0.941	2.313	41.435	14.438	-45.070	14.629	10.563
	9170.0	16.62	7.295	4.261	72.833	42.775	1.852	156.616	0.939	2.173	41.436	9.608	-58.040	13.066	9.325
	9180.0	15.83	7.292	4.248	72.719	42.570	1.865	166.476	0.938	2.029	41.437	4.805	-73.233	12.033	8.538
	9190.0	15.56	7.292	4.243	72.699	42.479	1.869	176.336	0.937	1.883	41.437	0.027	-89.900	11.667	8.266
	9200.0	15.82	7.292	4.247	72.776	42.467	1.862	186.196	0.938	0.993	41.437	-4.732	253.482	12.022	8.529
	9210.0	16.59	7.294	4.257	72.948	42.556	1.846	196.056	0.939	0.972	41.436	-9.475	238.431	13.029	9.296
	9220.0	17.79	7.297	4.276	73.214	42.740	1.820	205.916	0.941	0.938	41.435	-14.208	225.635	14.544	10.494
	9230.0	19.34	7.302	4.302	73.568	43.024	1.784	215.776	0.944	0.892	41.433	-18.936	215.019	16.417	12.036
ECATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMD	VEL1	ALPHA1	PHI1	VINF1	DV1

ECATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
9116	9140.0	21.32	7.308	4.337	74.144	43.277	1.728	127.335	0.948	2.580	41.431	24.092	-25.460	18.731	14.014
67	9200.0	17.43	7.302	4.299	73.795	42.665	1.770	137.195	0.944	2.449	41.433	19.200	-34.480	16.530	12.131
	9210.0	17.83	7.296	4.270	73.515	42.215	1.803	147.055	0.941	2.313	41.434	14.342	-45.304	14.592	10.533
	9220.0	16.60	7.293	4.249	73.317	41.901	1.827	156.915	0.939	2.172	41.435	9.513	-56.316	13.039	9.304
	9230.0	15.82	7.290	4.237	73.206	41.702	1.840	166.775	0.938	2.028	41.436	4.712	-73.547	12.018	8.527
	9240.0	15.55	7.290	4.232	73.188	41.605	1.844	176.635	0.937	1.000	41.436	-0.066	265.766	11.666	8.265
	9250.0	15.83	7.290	4.236	73.266	41.601	1.837	186.495	0.938	0.993	41.436	-4.824	253.170	12.034	8.539
	9260.0	16.61	7.292	4.247	73.439	41.686	1.820	196.355	0.939	0.971	41.435	-9.567	238.158	13.053	9.315
	9270.0	17.82	7.296	4.266	73.704	41.862	1.794	206.215	0.941	0.937	41.434	-14.301	225.404	14.577	10.521
	9280.0	19.37	7.300	4.292	74.057	42.137	1.757	216.075	0.944	0.891	41.432	-19.030	214.825	16.457	12.069
9166	9240.0	21.28	7.306	4.326	74.613	42.347	1.704	127.634	0.947	2.580	41.430	23.990	-25.630	18.682	13.971
17	9250.0	19.39	7.300	4.288	74.268	41.753	1.746	137.494	0.944	2.449	41.432	19.101	-34.679	16.487	12.095
	9260.0	17.80	7.294	4.259	73.993	41.316	1.779	147.354	0.941	2.312	41.433	14.245	-45.540	14.556	10.504
	9270.0	16.57	7.291	4.238	73.798	41.011	1.802	157.214	0.939	2.171	41.434	9.418	-56.595	13.112	9.283
	9280.0	15.80	7.289	4.226	73.640	40.819	1.816	167.074	0.938	2.027	41.435	4.618	-73.863	12.003	8.515
	9290.0	15.55	7.289	4.222	73.674	40.724	1.819	176.934	0.937	1.000	41.435	-0.159	269.436	11.665	8.264
	9300.0	15.84	7.288	4.225	73.753	40.719	1.812	186.794	0.938	0.992	41.435	-4.916	252.857	12.047	8.549
	9310.0	16.62	7.290	4.237	73.927	40.800	1.795	196.654	0.939	0.971	41.434	-9.660	237.884	13.078	9.334
	9320.0	17.84	7.294	4.256	74.192	40.969	1.768	206.514	0.941	0.936	41.433	-14.394	225.173	14.610	10.548
	9330.0	19.40	7.299	4.283	74.543	41.232	1.732	216.374	0.944	0.889	41.431	-19.124	214.630	16.496	12.103
9216	9240.0	21.23	7.304	4.315	75.080	41.400	1.680	127.933	0.947	2.581	41.429	23.887	-25.801	18.634	13.929
33	9300.0	19.36	7.298	4.278	74.739	40.824	1.722	137.793	0.944	2.449	41.431	19.001	-34.879	16.443	12.058
	9310.0	17.77	7.293	4.249	74.469	40.401	1.755	147.653	0.941	2.312	41.432	14.147	-45.778	14.520	10.475
	9320.0	16.55	7.289	4.228	74.277	40.107	1.778	157.513	0.939	2.170	41.433	9.322	-56.876	12.985	9.262
	9330.0	15.79	7.287	4.216	74.172	39.921	1.792	167.373	0.937	2.026	41.434	4.524	-74.181	11.969	8.505
	9340.0	15.55	7.286	4.211	74.158	39.829	1.795	177.233	0.937	1.000	41.434	-0.252	269.105	11.665	8.264
	9350.0	15.85	7.287	4.215	74.238	39.823	1.788	187.093	0.938	0.992	41.434	-5.010	252.543	12.061	8.559
	9360.0	16.64	7.289	4.227	74.412	39.899	1.771	196.953	0.939	0.970	41.433	-9.753	237.605	13.103	9.353
	9370.0	17.87	7.292	4.246	74.677	40.059	1.744	206.813	0.941	0.935	41.432	-14.488	224.941	14.644	10.575
	9380.0	19.43	7.297	4.274	75.026	40.310	1.707	216.673	0.944	0.888	41.430	-19.220	214.435	16.536	12.136
9266	9340.0	21.19	7.303	4.305	75.544	40.435	1.657	126.232	0.947	2.581	41.428	23.785	-25.973	18.585	13.887
83	9350.0	19.32	7.296	4.267	75.268	39.874	1.699	136.092	0.944	2.448	41.430	18.901	-35.081	16.400	12.022
	9360.0	17.74	7.291	4.238	74.942	39.471	1.732	147.952	0.941	2.311	41.431	14.049	-46.018	14.484	10.445
	9370.0	16.53	7.287	4.218	74.754	39.187	1.755	157.812	0.939	2.169	41.432	9.226	-56.160	12.958	9.242
	9380.0	15.78	7.285	4.206	74.651	39.008	1.769	167.672	0.937	2.024	41.433	4.429	-74.502	11.974	8.494
	9390.0	15.55	7.284	4.202	74.640	38.919	1.772	177.532	0.937	1.000	41.433	-0.346	268.771	11.665	8.264
	9400.0	15.85	7.285	4.206	74.721	38.911	1.764	187.392	0.937	0.992	41.433	-5.103	252.228	12.074	8.569
	9410.0	16.66	7.287	4.218	74.895	38.982	1.747	197.252	0.939	0.970	41.432	-9.847	237.334	13.128	9.373
	9420.0	17.89	7.291	4.237	75.159	39.133	1.720	207.112	0.941	0.935	41.431	-14.583	224.709	14.678	10.602
	9430.0	19.47	7.295	4.265	75.507	39.371	1.683	216.972	0.944	0.887	41.429	-19.316	214.240	16.577	12.170
ECATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1



TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

EDATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	FCCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
8959	9070.0	22.18	7.316	4.380	73.193	45.659	1.771	123.020	0.950	2.626	41.433	26.134	-22.144	19.703	14.864
183	9080.0	20.19	7.309	4.339	72.808	44.942	1.815	132.880	0.946	2.498	41.435	21.224	-30.553	17.418	12.883
	9090.0	18.46	7.303	4.307	72.492	44.405	1.852	142.740	0.942	2.364	41.436	16.348	-40.585	15.357	11.156
	9100.0	17.06	7.299	4.243	72.254	44.019	1.879	152.600	0.940	2.226	41.438	11.504	-52.668	13.627	9.763
	9110.0	16.09	7.296	4.267	72.103	43.763	1.896	162.460	0.938	2.083	41.438	6.689	-67.027	12.367	8.789
	9120.0	15.03	7.294	4.260	72.045	43.621	1.903	172.320	0.938	1.938	41.439	1.901	-83.269	11.727	8.310
	9130.0	15.60	7.295	4.200	72.083	43.583	1.901	182.180	0.938	0.997	41.439	-2.866	-259.889	11.800	8.364
	9140.0	16.24	7.296	4.267	72.219	43.641	1.888	192.040	0.939	0.982	41.438	-7.614	-244.091	12.566	8.940
	9150.0	17.23	7.295	4.283	72.451	43.797	1.866	201.900	0.940	0.953	41.437	-12.349	-230.389	13.900	9.979
	9160.0	18.70	7.303	4.305	72.775	44.054	1.834	211.760	0.943	0.911	41.436	-17.077	-218.958	15.648	11.396
9033	9100.0	22.93	7.312	4.389	73.666	45.369	1.734	119.602	0.951	2.672	41.431	27.875	-19.484	20.548	15.610
150	9110.0	20.87	7.310	4.345	73.263	44.589	1.782	129.462	0.947	2.546	41.433	22.954	-27.418	18.204	13.557
	9120.0	19.04	7.302	4.309	72.923	43.998	1.822	139.322	0.943	2.414	41.435	18.068	-36.824	16.054	11.732
	9130.0	17.51	7.295	4.283	72.658	43.567	1.852	149.182	0.941	2.277	41.436	13.214	-48.135	14.192	10.211
	9140.0	16.38	7.295	4.264	72.476	43.271	1.873	159.042	0.939	2.135	41.437	8.390	-61.690	12.749	9.080
	9150.0	15.71	7.295	4.254	72.365	43.092	1.884	168.902	0.938	1.991	41.438	3.593	-77.367	11.874	8.419
	9160.0	15.52	7.292	4.251	72.349	43.018	1.885	178.762	0.937	1.000	41.438	-1.180	-265.813	11.650	8.283
	9170.0	15.97	7.294	4.256	72.491	43.040	1.876	188.622	0.938	0.989	41.438	-5.934	-249.476	12.221	8.679
	9180.0	16.86	7.296	4.269	72.688	43.157	1.857	198.482	0.940	0.965	41.437	-10.674	-234.972	13.312	9.563
	9190.0	18.16	7.300	4.289	72.978	43.371	1.828	208.342	0.942	0.927	41.435	-15.405	-222.756	14.950	10.856
9083	9150.0	22.63	7.316	4.377	74.135	44.455	1.709	119.901	0.951	2.673	41.430	27.772	-19.637	20.496	15.564
100	9160.0	20.07	7.308	4.333	73.737	43.697	1.757	129.761	0.947	2.546	41.432	22.854	-27.593	18.156	13.516
	9170.0	18.00	7.301	4.298	73.402	43.116	1.796	139.621	0.943	2.413	41.434	17.970	-37.029	16.12	11.698
	9180.0	17.45	7.297	4.271	73.140	42.696	1.827	149.481	0.941	2.276	41.435	13.118	-48.379	14.158	10.184
	9190.0	16.55	7.293	4.253	72.962	42.408	1.848	159.341	0.939	2.135	41.436	8.296	-61.976	12.724	9.062
	9200.0	15.73	7.291	4.242	72.874	42.234	1.858	169.201	0.938	1.990	41.437	3.500	-77.686	11.862	8.410
	9210.0	15.58	7.291	4.240	72.850	42.102	1.859	179.062	0.937	0.999	41.437	-1.272	-265.487	11.693	8.285
	9220.0	15.94	7.292	4.245	72.982	42.183	1.850	188.922	0.938	0.989	41.436	-6.026	-249.176	12.237	8.691
	9230.0	16.68	7.294	4.258	73.160	42.295	1.831	198.781	0.940	0.964	41.435	-10.766	-234.710	13.398	9.583
	9240.0	18.15	7.296	4.278	73.479	42.502	1.802	208.641	0.942	0.926	41.434	-15.497	-222.536	15.025	10.884
9133	9200.0	22.63	7.314	4.366	74.601	43.523	1.684	129.201	0.951	2.673	41.429	27.668	-19.790	20.445	15.518
50	9210.0	20.78	7.306	4.322	74.208	42.778	1.732	139.061	0.947	2.546	41.431	22.753	-27.765	18.109	13.475
	9220.0	18.96	7.295	4.287	73.878	42.218	1.771	149.921	0.943	2.413	41.433	17.871	-37.236	15.970	11.663
	9230.0	17.45	7.295	4.260	73.621	41.810	1.802	159.781	0.940	2.275	41.434	13.021	-48.625	14.124	10.157
	9240.0	16.33	7.291	4.241	73.446	41.531	1.823	169.641	0.939	2.134	41.435	8.201	-62.265	12.700	9.043
	9250.0	15.67	7.285	4.231	73.360	41.362	1.833	169.501	0.937	1.989	41.436	3.407	-78.007	11.851	8.402
	9260.0	15.58	7.285	4.229	73.368	41.291	1.834	179.361	0.937	0.999	41.436	-1.365	-265.159	11.655	8.287
	9270.0	15.99	7.290	4.234	73.472	41.310	1.825	189.221	0.938	0.988	41.435	-6.118	-248.873	12.253	8.703
	9280.0	16.92	7.292	4.248	73.670	41.418	1.805	199.081	0.939	0.963	41.434	-10.859	-234.448	13.425	9.604
	9290.0	18.21	7.296	4.268	73.959	41.616	1.776	208.941	0.942	0.926	41.433	-15.591	-222.316	15.060	10.913
9183	9200.0	22.78	7.312	4.355	75.065	42.571	1.659	129.500	0.951	2.673	41.428	27.563	-19.944	20.393	15.473
C	9210.0	20.74	7.304	4.311	74.670	41.847	1.708	139.360	0.946	2.546	41.430	22.651	-27.946	18.062	13.435
	9220.0	18.93	7.297	4.276	74.352	41.303	1.747	149.220	0.943	2.413	41.432	17.772	-37.445	15.929	11.628
	9230.0	17.42	7.292	4.249	74.099	40.909	1.776	159.080	0.940	2.275	41.433	12.925	-48.873	14.050	10.130
	9240.0	16.31	7.285	4.231	73.927	40.638	1.796	169.940	0.938	2.133	41.434	8.106	-62.556	12.677	9.025
	9250.0	15.63	7.285	4.229	73.944	40.475	1.809	169.800	0.937	1.988	41.435	3.313	-78.331	11.840	8.394
	9260.0	15.58	7.287	4.218	73.854	40.406	1.810	179.660	0.937	0.999	41.435	-1.458	-264.830	11.659	8.289
	9270.0	16.00	7.289	4.224	73.959	40.423	1.800	189.520	0.938	0.988	41.434	-6.211	-248.568	12.269	8.715
	9280.0	16.92	7.291	4.238	74.157	40.525	1.780	199.380	0.939	0.963	41.433	-10.952	-234.185	13.452	9.626
	9290.0	18.24	7.294	4.259	74.445	40.714	1.751	209.240	0.942	0.925	41.432	-15.685	-222.095	15.095	10.941
EDATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

ECATE	TTIME	CV	SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1	
9233 317	9300.0	22.74	*	7.310	4.345	75.527	*	41.602	1.636	120.799	0.950	2.674	41.427	27.459	-20.095	20.341	15.427
	9310.0	20.70	*	7.302	4.301	75.145	*	40.899	1.684	130.659	0.946	2.546	41.429	22.549	-28.125	18.14	13.394
	9320.0	18.89	*	7.296	4.265	74.824	*	40.373	1.724	140.519	0.943	2.413	41.431	17.673	-37.655	15.887	11.594
	9330.0	17.39	*	7.291	4.239	74.574	*	39.992	1.754	150.379	0.940	2.274	41.432	12.828	-49.123	14.056	10.103
	9340.0	16.29	*	7.288	4.220	74.406	*	39.731	1.775	160.239	0.938	2.132	41.433	8.011	-62.845	12.653	9.007
	9350.0	15.07	*	7.286	4.210	74.326	*	39.573	1.786	170.099	0.937	1.986	41.434	3.219	-78.657	11.829	8.386
	9360.0	13.58	*	7.285	4.208	74.338	*	39.505	1.786	179.959	0.937	0.999	41.434	-1.551	264.499	11.702	8.292
	9370.0	16.01	*	7.286	4.214	74.443	*	39.520	1.776	189.819	0.938	0.988	41.433	-6.305	248.263	12.286	8.728
	9380.0	16.94	*	7.285	4.228	74.642	*	39.616	1.756	194.679	0.939	0.962	41.432	-11.046	233.922	13.480	9.647
	9390.0	18.26	*	7.292	4.250	74.929	*	39.796	1.726	209.539	0.942	0.924	41.431	-15.780	221.874	15.131	10.971
9263 267	9300.0	22.69	*	7.302	4.335	75.986	*	40.614	1.613	121.098	0.950	2.674	41.426	27.354	-20.255	20.289	15.381
	9350.0	20.65	*	7.300	4.291	75.609	*	39.934	1.661	133.958	0.946	2.546	41.428	22.447	-28.305	17.967	13.353
	9370.0	18.85	*	7.294	4.255	75.293	*	39.427	1.701	140.818	0.943	2.412	41.430	17.574	-37.867	15.845	11.559
	9380.0	17.37	*	7.289	4.229	75.046	*	39.059	1.732	150.676	0.940	2.274	41.431	12.730	-49.375	14.022	10.076
	9390.0	16.27	*	7.286	4.210	74.883	*	38.809	1.752	160.538	0.938	2.131	41.432	7.915	-63.144	12.629	8.989
	9400.0	15.66	*	7.284	4.200	74.805	*	38.656	1.763	170.398	0.937	1.985	41.433	3.124	-78.985	11.819	8.378
	9410.0	15.56	*	7.284	4.199	74.819	*	38.590	1.763	180.258	0.937	0.999	41.433	-1.645	244.167	11.706	8.295
	9420.0	16.03	*	7.285	4.205	74.925	*	38.602	1.753	190.118	0.938	0.987	41.432	-6.399	247.957	12.303	8.741
	9430.0	16.96	*	7.287	4.219	75.124	*	38.692	1.733	199.976	0.939	0.961	41.431	-11.140	233.658	13.508	9.669
	9440.0	18.24	*	7.291	4.241	75.410	*	38.861	1.703	209.838	0.942	0.923	41.430	-15.875	221.652	15.167	11.000
9333 217	9400.0	22.64	*	7.306	4.325	76.443	*	39.608	1.590	121.397	0.950	2.674	41.426	27.249	-20.412	20.238	15.335
	9410.0	20.61	*	7.298	4.281	76.071	*	38.952	1.639	131.257	0.946	2.546	41.427	22.345	-28.486	17.920	13.312
	9420.0	18.82	*	7.292	4.246	75.759	*	38.464	1.679	141.117	0.943	2.412	41.429	17.474	-38.080	15.804	11.525
	9430.0	17.34	*	7.287	4.219	75.518	*	38.112	1.709	150.977	0.940	2.273	41.430	12.632	-49.630	13.868	10.049
	9440.0	16.26	*	7.284	4.201	75.357	*	37.871	1.730	160.837	0.938	2.130	41.431	7.819	-63.442	12.606	8.971
	9450.0	15.05	*	7.282	4.191	75.262	*	37.725	1.740	170.697	0.937	1.984	41.432	3.029	-79.315	11.808	8.370
	9460.0	13.58	*	7.282	4.189	75.247	*	37.660	1.740	180.557	0.937	0.999	41.432	-1.740	263.823	11.710	8.298
	9470.0	16.04	*	7.281	4.196	75.404	*	37.669	1.730	190.417	0.938	0.987	41.431	-6.493	247.650	12.321	8.754
	9480.0	16.98	*	7.281	4.210	75.603	*	37.751	1.710	200.277	0.939	0.961	41.430	-11.235	233.394	13.536	9.692
	9490.0	18.32	*	7.290	4.233	75.869	*	37.904	1.680	210.137	0.942	0.922	41.429	-15.970	221.430	15.203	11.030
9383 167	9400.0	22.59	*	7.305	4.316	76.897	*	38.583	1.569	121.696	0.950	2.675	41.425	27.143	-20.571	20.186	15.289
	9450.0	20.57	*	7.297	4.272	76.531	*	37.954	1.618	131.557	0.946	2.546	41.427	22.242	-28.669	17.872	13.271
	9470.0	18.78	*	7.290	4.236	76.224	*	37.486	1.658	141.417	0.942	2.411	41.428	17.373	-38.256	15.762	11.490
	9480.0	17.31	*	7.286	4.210	75.987	*	37.150	1.688	151.276	0.940	2.272	41.429	12.534	-49.866	13.955	10.022
	9490.0	16.24	*	7.282	4.192	75.828	*	36.920	1.708	161.136	0.938	2.129	41.430	7.722	-63.742	12.583	8.953
	9500.0	15.04	*	7.281	4.182	75.756	*	36.779	1.719	170.996	0.937	1.982	41.431	2.933	-79.647	11.768	8.363
	9510.0	13.59	*	7.281	4.181	75.773	*	36.715	1.719	180.856	0.937	0.999	41.431	-1.835	263.458	11.715	8.301
	9520.0	16.05	*	7.282	4.187	75.881	*	36.721	1.708	190.716	0.938	0.986	41.430	-6.588	247.343	12.339	8.768
	9530.0	17.00	*	7.284	4.202	76.089	*	36.796	1.688	200.576	0.939	0.960	41.429	-11.330	233.129	13.565	9.714
	9540.0	18.35	*	7.288	4.225	76.365	*	36.947	1.657	210.437	0.942	0.921	41.428	-16.067	221.208	15.240	11.060
9433 117	9500.0	22.55	*	7.302	4.307	77.349	*	37.541	1.548	121.996	0.950	2.675	41.424	27.037	-20.730	20.134	15.243
	9510.0	20.53	*	7.295	4.263	76.988	*	36.938	1.597	131.656	0.946	2.546	41.426	22.140	-28.852	17.825	13.231
	9520.0	18.74	*	7.289	4.228	76.635	*	36.493	1.637	141.716	0.942	2.411	41.427	17.273	-38.513	15.820	11.456
	9530.0	17.26	*	7.284	4.201	76.452	*	36.172	1.667	151.576	0.940	2.271	41.429	12.436	-50.144	13.921	9.996
	9540.0	16.22	*	7.281	4.183	76.297	*	35.953	1.688	161.436	0.938	2.128	41.429	7.625	-64.045	12.560	8.936
	9550.0	15.04	*	7.275	4.173	76.227	*	35.819	1.698	171.296	0.937	1.981	41.430	2.837	-79.981	11.769	8.356
	9560.0	13.58	*	7.275	4.172	76.246	*	35.756	1.698	181.156	0.937	0.999	41.430	-1.930	263.161	11.720	8.305
	9570.0	16.06	*	7.280	4.174	76.355	*	35.759	1.687	191.016	0.938	0.986	41.429	-6.683	247.034	12.357	8.782
	9580.0	17.02	*	7.282	4.194	76.554	*	35.825	1.666	200.876	0.939	0.959	41.429	-11.426	232.864	13.564	9.737
	9590.0	18.38	*	7.287	4.217	76.837	*	35.957	1.635	210.736	0.942	0.920	41.427	-16.165	220.985	15.277	11.090
ECATE	TTIME	CV	SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1	

TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

EDATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
9483	9500.0	22.50	7.301	4.298	77.798	36.481	1.528	127.295	0.950	2.675	41.423	26.931	-20.890	20.082	15.197
67	9560.0	20.48	7.294	4.254	77.442	35.907	1.577	132.155	0.945	2.546	41.425	22.036	-24.038	17.777	13.190
	9570.0	18.71	7.287	4.219	77.144	35.484	1.617	142.015	0.942	2.410	41.427	17.172	-28.732	15.637	11.421
	9580.0	17.25	7.283	4.192	76.915	35.180	1.647	151.875	0.940	2.270	41.428	12.337	-35.405	13.887	9.969
	9590.0	16.20	7.280	4.174	76.764	34.973	1.668	161.735	0.938	2.127	41.429	7.527	-44.349	12.537	8.918
	9600.0	15.63	7.278	4.165	76.696	34.844	1.678	171.595	0.937	1.980	41.429	2.741	-55.317	11.779	8.349
	9610.0	15.59	7.278	4.164	76.717	34.782	1.677	181.455	0.937	0.999	41.429	-2.026	-68.823	11.725	8.308
	9620.0	16.08	7.279	4.171	76.827	34.781	1.666	191.315	0.938	0.986	41.429	-6.779	-84.725	12.376	8.796
	9630.0	17.04	7.282	4.186	77.025	34.838	1.645	201.175	0.939	0.959	41.428	-11.522	-103.599	13.624	9.761
	9640.0	18.41	7.286	4.210	77.308	34.957	1.614	211.035	0.942	0.919	41.426	-16.261	-124.762	15.315	11.121
9533	9600.0	22.45	7.300	4.290	78.244	35.404	1.509	127.594	0.949	2.675	41.423	26.825	-21.052	20.030	15.151
17	9610.0	20.44	7.292	4.246	77.894	34.860	1.556	132.454	0.945	2.545	41.424	21.933	-29.224	17.729	13.149
	9620.0	18.67	7.286	4.211	77.601	34.460	1.598	142.314	0.942	2.410	41.426	17.071	-38.952	15.637	11.387
	9630.0	17.22	7.281	4.184	77.376	34.174	1.628	152.174	0.939	2.270	41.427	12.237	-50.667	13.854	9.942
	9640.0	16.18	7.278	4.166	77.228	33.978	1.648	162.034	0.938	2.125	41.428	7.429	-64.656	12.514	8.901
	9650.0	15.62	7.277	4.157	77.162	33.856	1.658	171.894	0.937	1.978	41.428	2.644	-80.655	11.770	8.342
	9660.0	15.57	7.276	4.156	77.185	33.795	1.657	181.754	0.937	0.999	41.428	-2.123	-98.484	11.730	8.313
	9670.0	16.09	7.278	4.164	77.295	33.790	1.646	191.614	0.937	0.985	41.428	-6.875	-118.415	12.395	8.811
	9680.0	17.06	7.280	4.179	77.493	33.837	1.625	201.474	0.939	0.958	41.427	-11.619	-140.333	13.654	9.784
	9690.0	18.44	7.284	4.203	77.775	33.940	1.594	211.334	0.942	0.918	41.426	-16.358	-164.540	15.352	11.152
9583	9650.0	22.47	7.299	4.282	78.688	34.310	1.490	127.893	0.949	2.675	41.422	26.719	-21.214	19.977	15.105
33	9660.0	20.46	7.291	4.238	78.343	33.797	1.539	132.753	0.945	2.545	41.424	21.829	-29.412	17.682	13.108
	9670.0	18.64	7.284	4.203	78.055	33.421	1.579	142.613	0.942	2.409	41.425	16.969	-39.174	15.596	11.353
	9680.0	17.20	7.280	4.176	77.834	33.154	1.609	152.473	0.939	2.269	41.426	12.138	-50.932	13.820	9.916
	9690.0	16.16	7.277	4.159	77.689	32.970	1.629	162.333	0.938	2.124	41.427	7.331	-64.965	12.492	8.884
	9700.0	15.61	7.275	4.149	77.626	32.854	1.639	172.193	0.937	1.977	41.427	2.547	-80.995	11.761	8.336
	9710.0	15.59	7.275	4.149	77.650	32.794	1.638	182.053	0.937	0.998	41.427	-2.220	-98.143	11.736	8.317
	9720.0	16.10	7.276	4.156	77.761	32.784	1.627	191.913	0.937	0.985	41.427	-6.972	-118.105	12.415	8.825
	9730.0	17.04	7.279	4.172	77.959	32.821	1.606	201.773	0.939	0.957	41.426	-11.716	-140.067	13.684	9.808
	9740.0	18.47	7.283	4.196	78.239	32.908	1.574	211.633	0.942	0.917	41.425	-16.457	-164.316	15.351	11.184
9633	9700.0	22.36	7.297	4.275	79.129	33.149	1.472	123.192	0.949	2.675	41.421	26.612	-21.377	19.925	15.059
83	9710.0	20.36	7.289	4.230	78.789	32.718	1.522	133.052	0.945	2.545	41.423	21.725	-29.602	17.634	13.068
	9720.0	18.63	7.283	4.195	78.506	32.369	1.562	142.912	0.942	2.409	41.424	16.867	-39.398	15.554	11.318
	9730.0	17.17	7.279	4.167	78.289	32.120	1.591	152.772	0.939	2.268	41.426	12.037	-51.199	13.787	9.890
	9740.0	16.14	7.275	4.151	78.147	31.949	1.611	162.632	0.937	2.123	41.426	7.232	-65.276	12.470	8.867
	9750.0	15.60	7.274	4.142	78.087	31.839	1.621	172.492	0.937	1.975	41.427	2.449	-81.337	11.753	8.329
	9760.0	15.63	7.274	4.142	78.112	31.730	1.620	182.352	0.937	0.998	41.427	-2.317	-98.801	11.743	8.322
	9770.0	16.12	7.275	4.150	78.224	31.764	1.609	192.212	0.937	0.984	41.426	-7.070	-118.794	12.435	8.841
	9780.0	17.11	7.278	4.166	78.422	31.790	1.587	202.072	0.939	0.957	41.425	-11.814	-140.800	13.715	9.832
	9790.0	18.53	7.282	4.190	78.701	31.861	1.555	211.932	0.942	0.916	41.424	-16.555	-164.093	15.429	11.215
EDATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

ECATE	TIME	CV SUM *	CVZ	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMI0	VFL1	ALPHA1 *	PHI1	VINF1	DV1
9367 183	9440.0	21.35 *	7.300	4.230	76.510 *	36.435	1.630	127.840	0.947	2.594	41.426	24.071 *	-25.484	18.718	14.002
	9440.0	17.42 *	7.293	4.231	76.175 *	37.765	1.631	137.700	0.944	2.461	41.428	19.190 *	-34.431	16.522	12.124
	9440.0	17.32 *	7.284	4.222	75.913 *	37.577	1.635	147.560	0.941	2.324	41.429	14.339 *	-45.300	14.587	10.529
	9440.0	15.54 *	7.284	4.200	75.723 *	37.706	1.709	157.420	0.939	2.182	41.430	9.517 *	-58.297	13.035	9.301
	9440.0	15.81 *	7.282	4.188	75.618 *	37.132	1.723	167.280	0.937	2.037	41.431	4.720 *	-73.515	12.014	8.524
	9440.0	15.54 *	7.281	4.183	75.601 *	37.040	1.727	177.140	0.937	1.900	41.431	-0.056 *	-269.802	11.661	8.261
	9540.0	15.82 *	7.283	4.167	75.676 *	37.022	1.720	187.000	0.937	0.993	41.431	-4.814 *	-253.198	12.028	8.534
	9540.0	15.55 *	7.284	4.198	75.341 *	37.072	1.704	196.860	0.939	0.972	41.430	-9.559 *	-238.172	13.046	9.310
	9540.0	17.67 *	7.287	4.214	76.045 *	37.136	1.677	206.720	0.941	0.937	41.429	-14.297 *	-225.403	14.571	10.516
	9540.0	17.33 *	7.292	4.246	76.432 *	37.337	1.640	216.580	0.943	0.890	41.427	-17.032 *	-214.810	16.454	12.067
9400 150	9470.0	27.02 *	7.302	4.300	76.352 *	36.041	1.575	124.422	0.949	2.641	41.425	25.800 *	-22.655	19.537	14.718
	9440.0	27.00 *	7.294	4.258	76.612 *	37.467	1.622	134.282	0.945	2.511	41.427	20.909 *	-31.128	17.772	12.758
	9440.0	18.34 *	7.285	4.225	76.314 *	37.044	1.606	144.142	0.942	2.375	41.428	16.049 *	-41.248	15.233	11.054
	9540.0	18.97 *	7.284	4.201	76.039 *	35.743	1.687	154.002	0.939	2.234	41.429	11.218 *	-53.439	13.530	9.687
	9540.0	16.02 *	7.281	4.165	75.964 *	36.541	1.705	163.862	0.938	2.090	41.430	6.413 *	-67.909	12.364	8.742
	9540.0	15.57 *	7.280	4.179	75.915 *	36.424	1.712	173.722	0.937	1.943	41.430	1.630 *	-84.219	11.703	8.292
	9540.0	15.66 *	7.280	4.179	75.957 *	36.379	1.709	183.582	0.937	0.997	41.430	-3.133 *	-258.952	11.817	8.377
	9540.0	16.26 *	7.280	4.187	76.030 *	36.402	1.696	193.442	0.938	0.981	41.430	-7.883 *	-243.240	12.620	8.982
	9540.0	17.33 *	7.285	4.204	76.312 *	36.491	1.673	203.302	0.940	0.951	41.429	-12.623 *	-229.651	13.984	10.046
	9540.0	18.77 *	7.285	4.224	76.514 *	36.652	1.640	213.162	0.942	0.908	41.427	-17.359 *	-218.325	15.756	11.485
9450 100	9540.0	21.97 *	7.300	4.231	77.404 *	37.001	1.555	124.721	0.949	2.641	41.424	25.695 *	-22.821	19.486	14.673
	9540.0	20.01 *	7.292	4.250	77.059 *	36.452	1.602	134.581	0.945	2.510	41.426	20.807 *	-31.320	17.225	12.719
	9540.0	18.31 *	7.287	4.217	76.776 *	36.050	1.639	144.442	0.941	2.374	41.427	15.949 *	-41.476	15.193	11.022
	9540.0	18.95 *	7.283	4.192	76.564 *	35.764	1.667	154.302	0.939	2.233	41.429	11.120 *	-53.710	13.459	9.663
	9540.0	18.01 *	7.280	4.177	76.433 *	35.572	1.684	164.161	0.937	2.088	41.429	6.316 *	-68.222	12.284	8.727
	9540.0	15.57 *	7.275	4.169	76.387 *	35.459	1.692	174.021	0.937	1.941	41.430	1.534 *	-84.558	11.697	8.288
	9540.0	15.66 *	7.273	4.170	76.430 *	35.414	1.689	183.881	0.937	0.997	41.429	-3.229 *	-258.620	11.826	8.384
	9540.0	16.23 *	7.280	4.179	76.563 *	35.432	1.675	193.741	0.938	0.980	41.429	-7.978 *	-242.943	12.641	8.998
	9640.0	17.35 *	7.283	4.197	76.785 *	35.512	1.652	203.601	0.940	0.950	41.428	-12.719 *	-229.398	14.016	10.071
	9640.0	18.81 *	7.282	4.222	77.090 *	35.658	1.618	213.461	0.942	0.907	41.427	-17.457 *	-218.112	15.795	11.517
9500 50	9540.0	21.93 *	7.299	4.203	77.854 *	35.943	1.535	125.021	0.948	2.641	41.423	25.590 *	-22.987	19.435	14.628
	9540.0	19.97 *	7.291	4.241	77.514 *	35.422	1.582	134.881	0.944	2.510	41.425	20.704 *	-31.514	17.179	12.680
	9540.0	18.27 *	7.285	4.208	77.235 *	35.041	1.619	144.741	0.941	2.373	41.427	15.848 *	-41.706	15.154	10.989
	9640.0	18.92 *	7.281	4.184	77.027 *	34.770	1.647	154.601	0.939	2.232	41.428	11.021 *	-53.982	13.468	9.638
	9640.0	15.53 *	7.275	4.168	76.899 *	34.589	1.664	164.461	0.937	2.087	41.428	6.219 *	-68.538	12.265	8.712
	9640.0	15.56 *	7.277	4.161	76.855 *	34.481	1.672	174.321	0.937	1.940	41.429	1.438 *	-84.898	11.692	8.284
	9640.0	15.67 *	7.277	4.162	76.900 *	34.436	1.668	184.181	0.937	0.997	41.429	-3.325 *	-258.287	11.835	8.390
	9540.0	16.23 *	7.275	4.172	77.034 *	34.448	1.655	194.041	0.938	0.980	41.428	-8.075 *	-242.644	12.663	9.015
	9640.0	17.34 *	7.282	4.189	77.255 *	34.517	1.631	203.901	0.940	0.949	41.427	-12.816 *	-229.144	14.048	10.096
	9640.0	18.84 *	7.287	4.215	77.554 *	34.647	1.597	213.761	0.942	0.906	41.426	-17.554 *	-217.900	15.834	11.550
9550 0	9620.0	21.84 *	7.297	4.275	78.301 *	34.868	1.516	125.321	0.948	2.641	41.423	25.484 *	-23.155	19.384	14.584
	9640.0	19.93 *	7.290	4.233	77.966 *	34.376	1.563	135.180	0.944	2.510	41.425	20.601 *	-31.710	17.133	12.640
	9640.0	18.24 *	7.284	4.200	77.692 *	34.017	1.600	145.040	0.941	2.373	41.426	15.748 *	-41.937	15.114	10.957
	9640.0	16.89 *	7.280	4.176	77.488 *	33.763	1.628	154.900	0.939	2.231	41.427	10.922 *	-54.258	13.437	9.614
	9640.0	15.97 *	7.277	4.160	77.362 *	33.592	1.645	164.760	0.937	2.086	41.428	6.121 *	-68.856	12.246	8.698
	9640.0	15.50 *	7.276	4.153	77.321 *	33.489	1.652	174.620	0.937	1.938	41.428	1.341 *	-85.241	11.687	8.280
	9640.0	15.67 *	7.276	4.155	77.367 *	33.443	1.649	184.480	0.937	0.996	41.428	-3.421 *	-257.952	11.845	8.397
	9640.0	16.31 *	7.278	4.164	77.501 *	33.449	1.635	194.340	0.938	0.979	41.427	-8.171 *	-242.345	12.686	9.032
	9700.0	17.43 *	7.281	4.182	77.722 *	33.507	1.611	204.200	0.940	0.948	41.426	-12.913 *	-228.890	14.080	10.122
	9710.0	18.87 *	7.285	4.208	78.024 *	33.620	1.577	214.060	0.942	0.905	41.425	-17.653 *	-217.686	15.874	11.583
ECATE	TIME	CV SUM *	CVZ	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMI0	VEL1	ALPHA1 *	PHI1	VINF1	DV1

TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATE	TIME	CV	SLV	★	DV2	VINF2	PHI2	★	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	★	PHI1	VINF1	DV1
5600 317	5670.0	21.63	7.294	4.257	78.745	33.778	1.498	125.619	0.948	2.641	41.422	25.379	•	-23.324	19.333	14.539			
	9640.0	17.69	7.286	4.225	78.416	33.315	1.545	135.479	0.944	2.509	41.424	20.498	•	-31.906	17.087	12.601			
	9650.0	18.21	7.283	4.192	78.146	32.979	1.582	145.339	0.941	2.372	41.425	15.646	•	-42.171	15.074	10.925			
	9700.0	18.67	7.274	4.103	77.346	32.742	1.609	155.193	0.939	2.230	41.426	10.822	•	-54.536	13.407	9.590			
	9710.0	18.95	7.275	4.133	77.823	32.561	1.627	165.059	0.937	2.085	41.427	6.023	•	-69.176	12.227	8.683			
	9720.0	18.55	7.275	4.146	77.784	32.483	1.633	174.919	0.937	1.937	41.427	1.244	•	-85.585	11.682	8.277			
	9730.0	18.64	7.275	4.148	77.832	32.435	1.630	184.779	0.937	0.996	41.427	-3.518	•	-257.616	11.855	8.405			
	9740.0	18.33	7.277	4.157	77.956	32.436	1.616	194.639	0.938	0.979	41.427	-8.268	•	-242.045	12.709	9.050			
	9750.0	17.43	7.268	4.176	78.186	32.482	1.532	204.499	0.940	0.948	41.426	-13.011	•	-228.636	14.113	10.148			
	9760.0	18.90	7.284	4.207	78.447	32.577	1.558	214.359	0.942	0.904	41.424	-17.752	•	-217.473	15.914	11.616			
5650 267	5720.0	21.79	7.294	4.257	78.146	32.671	1.480	125.918	0.948	2.641	41.421	25.272	•	-23.494	19.282	14.494			
	9730.0	18.08	7.287	4.218	78.863	32.737	1.527	135.778	0.944	2.509	41.423	20.394	•	-32.104	17.041	12.562			
	9740.0	18.17	7.281	4.185	78.594	31.927	1.564	145.636	0.941	2.371	41.425	15.545	•	-42.406	15.035	10.892			
	9750.0	18.64	7.277	4.161	78.401	31.707	1.532	155.494	0.939	2.229	41.426	10.723	•	-54.815	13.376	9.566			
	9760.0	18.54	7.275	4.146	78.242	31.555	1.609	165.355	0.937	2.083	41.426	5.924	•	-69.498	12.288	8.669			
	9770.0	18.55	7.275	4.137	78.245	31.464	1.615	175.218	0.936	1.935	41.427	1.146	•	-85.931	11.678	8.274			
	9780.0	18.61	7.274	4.141	78.295	31.417	1.612	185.078	0.937	0.996	41.426	-3.616	•	-257.280	11.865	8.412			
	9790.0	18.34	7.275	4.151	78.428	31.409	1.536	194.930	0.938	0.978	41.426	-8.366	•	-241.746	12.732	9.067			
	9800.0	17.45	7.274	4.167	78.644	31.442	1.573	204.794	0.940	0.947	41.425	-13.109	•	-228.381	14.146	10.175			
	9810.0	18.93	7.292	4.135	78.947	31.517	1.559	214.658	0.942	0.903	41.424	-17.851	•	-217.260	15.954	11.650			
9700 217	9770.0	21.74	7.292	4.252	78.625	31.549	1.484	126.217	0.948	2.641	41.421	25.166	•	-23.665	19.231	14.450			
	9780.0	18.01	7.286	4.211	78.367	31.149	1.510	136.077	0.944	2.509	41.423	20.290	•	-32.304	16.955	12.523			
	9790.0	18.14	7.281	4.174	78.245	30.862	1.548	146.937	0.941	2.371	41.424	15.443	•	-42.643	14.955	10.860			
	9800.0	18.02	7.276	4.154	78.354	30.660	1.575	156.797	0.938	2.228	41.425	10.622	•	-55.097	13.346	9.542			
	9810.0	18.93	7.275	4.139	78.737	30.521	1.532	166.657	0.937	2.082	41.426	5.825	•	-69.823	12.190	8.655			
	9820.0	18.54	7.277	4.152	78.762	30.433	1.536	176.517	0.936	1.933	41.426	1.048	•	-86.279	11.673	8.271			
	9830.0	18.67	7.277	4.134	78.752	30.348	1.534	186.377	0.937	0.996	41.426	-3.714	•	-256.943	11.876	8.420			
	9840.0	18.36	7.274	4.145	78.884	30.367	1.580	196.237	0.938	0.978	41.425	-8.464	•	-241.445	12.755	9.085			
	9850.0	17.48	7.274	4.163	79.105	30.338	1.555	206.097	0.940	0.946	41.424	-13.208	•	-228.126	14.180	10.202			
	9860.0	18.97	7.286	4.170	79.404	30.445	1.521	214.957	0.942	0.902	41.423	-17.951	•	-217.047	15.955	11.684			
9750 167	9870.0	21.70	7.297	4.245	80.061	30.412	1.447	126.515	0.948	2.641	41.420	25.059	•	-23.837	19.180	14.405			
	9880.0	18.77	7.286	4.204	79.749	30.546	1.494	136.376	0.944	2.508	41.427	20.186	•	-32.505	16.948	12.484			
	9890.0	18.11	7.277	4.171	79.442	29.784	1.531	146.236	0.941	2.370	41.423	15.341	•	-42.882	14.956	10.828			
	9900.0	18.79	7.275	4.147	79.303	29.600	1.558	156.096	0.938	2.227	41.424	10.522	•	-55.381	13.315	9.519			
	9910.0	18.91	7.275	4.152	79.193	29.473	1.575	166.956	0.937	2.081	41.425	5.726	•	-70.150	12.171	8.642			
	9920.0	18.54	7.271	4.166	79.157	29.307	1.582	176.816	0.936	1.932	41.425	0.949	•	-86.628	11.670	8.268			
	9930.0	18.70	7.271	4.128	79.215	29.338	1.577	186.677	0.937	0.995	41.425	-3.812	•	-256.604	11.867	8.429			
	9940.0	18.35	7.272	4.139	79.344	29.316	1.565	196.536	0.938	0.977	41.425	-8.562	•	-241.144	12.779	9.104			
	9950.0	17.51	7.277	4.158	79.562	29.329	1.538	206.396	0.940	0.945	41.424	-13.307	•	-227.872	14.213	10.229			
	9960.0	18.90	7.281	4.165	79.858	29.356	1.533	216.256	0.942	0.901	41.422	-18.051	•	-216.833	16.26	11.718			
9800 117	9970.0	21.63	7.291	4.234	80.444	29.261	1.432	126.816	0.948	2.641	41.420	24.952	•	-24.010	19.129	14.360			
	9980.0	18.73	7.283	4.197	80.147	29.929	1.479	136.676	0.944	2.503	41.421	20.082	•	-32.707	16.902	12.445			
	9990.0	18.07	7.275	4.164	79.936	29.693	1.516	146.536	0.941	2.369	41.423	15.239	•	-43.122	14.916	10.796			
	0000.0	18.77	7.274	4.141	79.750	29.528	1.543	156.396	0.938	2.226	41.424	10.421	•	-55.667	13.285	9.495			
	0010.0	18.90	7.271	4.166	79.649	29.412	1.559	166.256	0.937	2.079	41.424	5.626	•	-70.478	12.153	8.628			
	0020.0	18.54	7.270	4.124	79.610	29.333	1.566	176.115	0.936	1.930	41.425	0.850	•	-86.979	11.666	8.265			
	0030.0	18.71	7.275	4.162	79.501	29.281	1.561	186.976	0.937	0.995	41.424	-3.910	•	-256.265	11.898	8.437			
	0040.0	18.39	7.272	4.153	79.795	29.250	1.547	196.836	0.938	0.977	41.424	-8.661	•	-240.843	12.804	9.123			
	0050.0	17.53	7.271	4.152	80.015	29.239	1.522	206.696	0.940	0.945	41.423	-13.406	•	-227.617	14.248	10.256			
	0060.0	18.03	7.281	4.160	80.305	29.252	1.487	216.556	0.942	0.900	41.422	-18.152	•	-216.615	16.078	11.752			
ECATE	TIME	CV	SLV	★	DV2	VINF2	PHI2	★	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	★	PHI1	VINF1	DV1

EDATE	TTIME	DV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
9850 67	9970.0	21.61	7.290	4.233	80.925	28.097	1.418	127.115	0.947	2.641	41.419	24.845	-24.185	19.078	14.315	
	9930.0	19.69	7.282	4.191	80.623	27.800	1.464	136.975	0.944	2.507	41.421	19.977	-32.911	16.856	12.406	
	9940.0	18.04	7.277	4.158	80.376	27.591	1.501	146.835	0.941	2.368	41.422	15.136	-43.365	14.877	10.764	
	9950.0	16.74	7.273	4.135	80.195	27.444	1.528	156.695	0.938	2.225	41.423	10.320	-55.955	13.255	9.472	
	9960.0	15.88	7.270	4.120	80.087	27.341	1.544	166.555	0.937	2.078	41.424	5.526	-70.809	12.136	8.615	
	9970.0	15.53	7.269	4.114	80.058	27.266	1.550	176.415	0.936	1.928	41.424	0.751	-87.332	11.663	8.263	
	9980.0	15.72	7.269	4.116	80.112	27.212	1.546	186.275	0.936	0.995	41.424	-4.010	-255.924	11.910	8.446	
	9990.0	16.41	7.271	4.122	80.248	27.172	1.531	196.135	0.938	0.976	41.423	-8.760	240.542	12.829	9.142	
	10000.0	17.56	7.275	4.147	80.465	27.145	1.506	205.995	0.940	0.944	41.422	-13.506	227.362	14.282	10.284	
10010.0	19.07	7.280	4.176	80.757	27.135	1.471	215.855	0.942	0.899	41.421	-18.253	216.406	16.119	11.787		
9900 17	9970.0	21.56	7.285	4.227	81.352	26.920	1.404	127.414	0.947	2.640	41.419	24.738	-24.360	19.026	14.271	
	9980.0	19.65	7.281	4.185	81.056	26.659	1.450	137.274	0.943	2.506	41.420	19.872	-33.116	16.810	12.367	
	9990.0	18.01	7.276	4.152	80.814	26.477	1.487	147.134	0.940	2.367	41.422	15.033	-43.609	14.838	10.732	
	10000.0	16.72	7.272	4.129	80.636	26.350	1.513	156.994	0.938	2.224	41.423	10.218	-56.245	13.725	9.448	
	10010.0	15.87	7.269	4.114	80.531	26.258	1.530	166.854	0.937	2.076	41.423	5.426	-71.142	12.118	8.602	
	10020.0	15.53	7.268	4.108	80.505	26.188	1.536	176.714	0.936	1.927	41.423	0.651	-87.686	11.660	8.261	
	10030.0	15.72	7.269	4.111	80.559	26.131	1.531	186.574	0.936	0.995	41.423	-4.109	-255.584	11.922	8.455	
	10040.0	16.43	7.271	4.123	80.696	26.082	1.516	196.434	0.938	0.975	41.423	-8.860	240.242	12.854	9.161	
	10050.0	17.59	7.274	4.143	80.911	26.039	1.491	206.294	0.940	0.943	41.422	-13.607	227.106	14.317	10.312	
10060.0	19.10	7.279	4.171	81.201	26.004	1.455	216.154	0.942	0.898	41.421	-18.355	216.192	16.162	11.822		
9950 33	10020.0	21.51	7.282	4.221	81.777	25.732	1.390	127.713	0.947	2.640	41.418	24.630	-24.537	18.975	14.226	
	10030.0	19.61	7.280	4.179	81.486	25.507	1.437	137.573	0.943	2.506	41.420	19.766	-33.323	16.764	12.328	
	10040.0	17.97	7.275	4.147	81.248	25.353	1.473	147.433	0.940	2.366	41.421	14.929	-43.855	14.759	10.700	
	10050.0	16.70	7.271	4.123	81.075	25.246	1.500	157.293	0.938	2.222	41.422	10.116	-56.538	13.195	9.425	
	10060.0	15.86	7.268	4.109	80.973	25.166	1.516	167.153	0.937	2.075	41.423	5.325	-71.477	12.101	8.589	
	10070.0	15.53	7.267	4.103	80.948	25.100	1.522	177.013	0.936	1.925	41.423	0.551	-88.041	11.658	8.259	
	10080.0	15.73	7.268	4.106	81.004	25.040	1.517	186.873	0.936	0.994	41.423	-4.209	-255.242	11.935	8.464	
	10090.0	16.45	7.270	4.118	81.140	24.981	1.502	196.733	0.938	0.975	41.422	-8.960	239.938	12.879	9.180	
	10100.0	17.61	7.273	4.138	81.355	24.920	1.476	206.593	0.940	0.942	41.421	-13.708	226.851	14.353	10.340	
10110.0	19.14	7.278	4.167	81.643	24.860	1.441	216.453	0.942	0.897	41.420	-18.457	215.978	16.204	11.858		
10000 83	10070.0	21.47	7.287	4.215	82.202	24.523	1.378	128.012	0.947	2.640	41.418	24.523	-24.714	18.924	14.181	
	10080.0	19.57	7.279	4.174	81.913	24.345	1.424	137.872	0.943	2.505	41.420	19.661	-33.531	16.718	12.289	
	10090.0	17.94	7.274	4.141	81.680	24.220	1.461	147.732	0.940	2.365	41.421	14.825	-44.103	14.759	10.668	
	10100.0	16.67	7.270	4.118	81.510	24.132	1.487	157.592	0.938	2.221	41.422	10.014	-56.832	13.166	9.402	
	10110.0	15.84	7.267	4.104	81.411	24.064	1.503	167.452	0.937	2.073	41.422	5.224	-71.814	12.084	8.576	
	10120.0	15.52	7.266	4.098	81.389	24.003	1.509	177.312	0.936	1.923	41.422	0.451	-88.398	11.656	8.257	
	10130.0	15.74	7.267	4.101	81.445	23.940	1.504	187.172	0.936	0.994	41.422	-4.309	-254.899	11.748	8.474	
	10140.0	16.47	7.269	4.113	81.582	23.870	1.488	197.032	0.938	0.974	41.422	-9.061	239.635	12.905	9.200	
	10150.0	17.64	7.273	4.134	81.795	23.791	1.462	206.892	0.940	0.941	41.421	-13.809	226.596	14.388	10.369	
10160.0	19.17	7.278	4.163	82.082	23.704	1.427	216.752	0.942	0.896	41.420	-18.559	215.764	16.247	11.894		
EDATE	TTIME	DV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATE	T TIME	CV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
9734	9800.0	22.47	7.295	4.265	80.047	30.958	1.433	122.800	0.949	2.688	41.420	26.891	-20.946	20.059	15.177
183	9810.0	20.46	7.288	4.220	79.714	30.532	1.483	132.660	0.945	2.558	41.422	22.006	-25.086	17.760	13.176
	9820.0	18.69	7.281	4.164	79.434	30.226	1.524	142.520	0.942	2.421	41.423	17.150	-38.773	15.667	11.411
	9830.0	17.24	7.276	4.157	79.218	30.009	1.555	152.380	0.939	2.280	41.424	12.321	-50.440	13.879	9.962
	9840.0	16.19	7.273	4.139	79.075	29.859	1.575	162.240	0.937	2.135	41.425	7.516	-64.378	12.531	8.914
	9850.0	15.62	7.272	4.129	79.011	29.758	1.586	172.100	0.936	1.987	41.425	2.733	-80.344	11.775	8.346
	9860.0	15.58	7.271	4.128	79.031	29.696	1.586	181.960	0.936	0.999	41.425	-2.034	-96.796	11.722	8.306
	9870.0	16.07	7.273	4.136	79.136	29.665	1.575	191.820	0.937	0.986	41.425	-6.787	-113.694	12.374	8.795
	9880.0	17.04	7.276	4.152	79.324	29.664	1.554	201.680	0.939	0.959	41.424	-11.533	-131.561	13.624	9.761
	9890.0	18.40	7.280	4.176	79.593	29.693	1.523	211.540	0.941	0.919	41.423	-16.277	-150.719	15.318	11.124
9768	9840.0	21.15	7.289	4.231	80.124	29.908	1.455	129.242	0.947	2.606	41.421	23.724	-26.062	18.551	13.857
150	9850.0	19.28	7.283	4.192	79.827	29.584	1.500	139.102	0.943	2.472	41.422	18.859	-35.152	16.376	12.002
	9860.0	17.71	7.277	4.161	79.590	29.353	1.534	148.962	0.940	2.332	41.423	14.022	-46.072	14.467	10.432
	9870.0	16.51	7.274	4.140	79.421	29.192	1.558	158.822	0.938	2.188	41.424	9.210	-59.197	12.947	9.233
	9880.0	15.76	7.271	4.127	79.330	29.081	1.572	168.682	0.937	2.041	41.425	4.419	-74.527	11.965	8.487
	9890.0	15.53	7.271	4.123	79.319	29.009	1.576	178.542	0.936	1.000	41.425	-0.352	-90.748	11.657	8.306
	9900.0	15.64	7.271	4.128	79.394	28.964	1.569	188.402	0.937	0.992	41.425	-5.110	-106.197	12.068	8.564
	9910.0	16.64	7.274	4.141	79.552	28.945	1.552	198.262	0.938	0.970	41.424	-9.859	-123.287	13.124	9.370
	9920.0	17.83	7.277	4.162	79.791	28.951	1.524	208.122	0.940	0.934	41.423	-14.603	-141.645	14.679	10.603
	9930.0	19.46	7.282	4.192	80.105	28.988	1.486	217.982	0.943	0.887	41.422	-19.348	-160.160	16.564	12.177
9818	9890.0	21.10	7.288	4.225	80.558	28.763	1.440	121.542	0.946	2.606	41.420	23.617	-26.243	18.501	13.814
100	9900.0	19.25	7.281	4.185	80.266	28.470	1.484	131.401	0.943	2.471	41.422	18.755	-35.365	16.331	11.964
	9910.0	17.68	7.272	4.155	80.033	28.264	1.519	141.261	0.940	2.331	41.423	13.920	-46.325	14.430	10.402
	9920.0	16.48	7.272	4.134	79.868	28.120	1.543	151.121	0.938	2.187	41.424	9.109	-59.496	12.919	9.212
	9930.0	15.75	7.270	4.121	79.779	28.018	1.557	160.981	0.937	2.039	41.424	4.320	-74.865	11.951	8.477
	9940.0	15.53	7.270	4.117	79.771	27.949	1.560	170.841	0.936	1.000	41.424	-0.451	-90.396	11.658	8.259
	9950.0	15.65	7.270	4.122	79.846	27.900	1.553	180.701	0.937	0.991	41.424	-5.209	-106.866	12.083	8.575
	9960.0	16.66	7.272	4.135	80.004	27.871	1.535	190.562	0.938	0.969	41.423	-9.958	-123.998	13.151	9.391
	9970.0	17.91	7.277	4.157	80.242	27.860	1.508	200.422	0.940	0.934	41.422	-14.703	-141.402	14.715	10.633
	9980.0	19.44	7.282	4.187	80.554	27.872	1.470	210.281	0.943	0.886	41.421	-19.449	-160.955	16.628	12.213
9868	9940.0	21.06	7.287	4.218	80.989	27.604	1.420	129.841	0.946	2.605	41.420	23.511	-26.425	18.451	13.771
50	9950.0	19.21	7.280	4.179	80.702	27.345	1.470	139.701	0.943	2.470	41.421	18.651	-35.578	16.287	11.927
	9960.0	17.65	7.275	4.149	80.473	27.164	1.504	149.561	0.940	2.330	41.422	13.817	-46.575	14.392	10.372
	9970.0	16.46	7.271	4.128	80.312	27.036	1.528	159.421	0.938	2.186	41.423	9.008	-59.797	12.852	9.191
	9980.0	15.74	7.269	4.115	80.226	26.945	1.542	169.281	0.937	2.038	41.424	4.220	-75.205	11.937	8.466
	9990.0	15.53	7.269	4.112	80.219	26.878	1.545	179.141	0.936	1.000	41.424	-0.551	-90.043	11.659	8.260
	10000.0	15.86	7.270	4.117	80.296	26.826	1.538	189.001	0.937	0.991	41.424	-5.308	-106.534	12.059	8.587
	10010.0	16.68	7.272	4.130	80.453	26.785	1.520	198.861	0.938	0.968	41.423	-10.057	-123.709	13.179	9.413
	10020.0	17.94	7.276	4.152	80.690	26.756	1.492	208.721	0.940	0.933	41.422	-14.803	-141.158	14.752	10.662
	10030.0	19.53	7.281	4.183	81.000	26.742	1.454	218.581	0.943	0.885	41.421	-19.551	-160.751	16.671	12.250
9918	9990.0	21.01	7.285	4.213	81.417	26.434	1.412	130.140	0.946	2.605	41.419	23.404	-26.608	18.401	13.727
0	10000.0	19.17	7.279	4.173	81.136	26.208	1.456	140.000	0.943	2.470	41.421	18.546	-35.794	16.242	11.890
	10010.0	17.62	7.274	4.143	80.911	26.052	1.490	149.860	0.940	2.329	41.422	13.714	-46.836	14.355	10.342
	10020.0	16.44	7.270	4.122	80.754	25.942	1.514	159.720	0.938	2.184	41.423	8.907	-60.100	12.866	9.170
	10030.0	15.72	7.268	4.110	80.670	25.861	1.528	169.580	0.936	2.036	41.423	4.120	-75.548	11.923	8.456
	10040.0	15.53	7.268	4.106	80.665	25.796	1.531	179.440	0.936	1.000	41.423	-0.651	-90.688	11.660	8.261
	10050.0	15.67	7.265	4.112	80.742	25.740	1.523	189.300	0.937	0.991	41.423	-5.408	-106.201	12.115	8.599
	10060.0	16.71	7.271	4.125	80.900	25.688	1.505	199.160	0.938	0.968	41.422	-10.158	-123.415	13.207	9.435
	10070.0	17.97	7.275	4.148	81.135	25.640	1.477	209.020	0.940	0.932	41.421	-14.904	-141.915	14.789	10.693
	10080.0	19.57	7.280	4.179	81.443	25.599	1.439	218.880	0.943	0.883	41.420	-19.653	-160.547	16.715	12.287
ECATE	T TIME	CV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

ECATF	TIME	CV	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
5968	10000.0	20.97	7.281	4.207	81.842	24.253	1.399	130.439	0.946	2.605	41.419	23.297	-26.792	18.351	13.684
317	10000.0	17.13	7.277	4.168	81.566	25.061	1.443	140.297	0.942	2.469	41.420	18.441	-36.011	16.198	11.852
	10000.0	17.53	7.273	4.138	81.346	24.931	1.477	150.159	0.940	2.328	41.421	13.611	-47.095	14.318	10.313
	10000.0	17.42	7.270	4.117	81.192	24.838	1.501	160.019	0.938	2.183	41.422	8.805	-58.406	12.439	9.149
	10000.0	17.71	7.267	4.105	81.111	24.767	1.514	169.879	0.936	2.035	41.423	4.019	-69.892	11.910	8.446
	10000.0	17.53	7.267	4.101	81.108	24.735	1.517	170.739	0.936	1.900	41.423	-0.751	-81.332	11.662	8.262
	10100.0	17.68	7.265	4.107	81.186	24.643	1.509	180.599	0.937	0.990	41.423	-5.508	-92.868	12.131	8.611
	10100.0	17.73	7.270	4.121	81.343	24.579	1.491	190.459	0.938	0.967	41.422	-10.258	-103.129	13.236	9.457
	10100.0	18.00	7.274	4.144	81.578	24.512	1.463	200.319	0.940	0.931	41.421	-15.006	-113.671	14.827	10.723
	10100.0	19.00	7.280	4.175	81.883	24.442	1.425	210.179	0.943	0.882	41.420	-19.756	-123.342	16.759	12.324
10018	10000.0	20.92	7.284	4.202	82.264	24.061	1.387	130.738	0.946	2.604	41.418	23.189	-26.977	18.301	13.641
267	10100.0	17.03	7.277	4.163	81.994	23.905	1.431	140.598	0.942	2.468	41.420	18.336	-36.229	16.153	11.815
	10100.0	17.50	7.272	4.133	81.778	23.800	1.464	150.458	0.939	2.327	41.421	13.508	-47.355	14.282	10.283
	10100.0	17.42	7.269	4.112	81.627	23.725	1.488	160.318	0.937	2.182	41.422	8.703	-58.713	12.412	9.129
	10100.0	17.70	7.267	4.100	81.549	23.664	1.501	170.178	0.936	2.033	41.422	3.918	-69.892	11.857	8.436
	10100.0	17.53	7.265	4.097	81.548	23.603	1.504	180.038	0.936	1.900	41.422	-0.851	-81.332	11.664	8.263
	10100.0	17.89	7.267	4.102	81.626	23.537	1.496	189.898	0.937	0.990	41.422	-5.609	-92.868	12.148	8.624
	10100.0	18.75	7.270	4.117	81.784	23.461	1.478	199.758	0.938	0.967	41.421	-10.359	-103.129	13.265	9.479
	10100.0	18.03	7.274	4.140	82.017	23.372	1.449	209.618	0.940	0.930	41.420	-15.108	-113.671	14.865	10.754
	10100.0	19.04	7.275	4.171	82.320	23.274	1.411	219.478	0.943	0.881	41.419	-19.859	-123.138	16.804	12.361
10068	10100.0	20.93	7.292	4.245	82.993	23.046	1.323	121.177	0.950	2.734	41.416	27.960	-19.330	20.178	15.637
217	10100.0	20.94	7.283	4.197	82.675	22.884	1.376	131.037	0.946	2.604	41.418	23.081	-27.166	18.250	13.597
	10100.0	17.05	7.277	4.158	82.418	22.732	1.419	140.897	0.942	2.467	41.419	18.230	-36.445	16.109	11.778
	10100.0	17.53	7.271	4.128	82.207	22.661	1.453	150.757	0.939	2.326	41.420	13.404	-47.618	14.254	10.254
	10100.0	17.43	7.265	4.107	82.060	22.604	1.476	160.617	0.937	2.180	41.421	8.601	-58.713	12.766	9.109
	10100.0	17.69	7.265	4.095	81.984	22.552	1.489	170.477	0.936	2.031	41.422	3.816	-69.892	11.884	8.427
	10100.0	17.53	7.265	4.092	81.985	22.494	1.491	180.337	0.936	1.900	41.422	-0.952	-81.332	11.666	8.265
	10200.0	17.50	7.264	4.090	82.064	22.427	1.483	190.197	0.937	0.990	41.422	-5.710	-92.868	12.165	8.637
	10200.0	17.77	7.269	4.113	82.221	22.332	1.465	200.057	0.938	0.966	41.421	-10.461	-103.129	13.294	9.502
	10200.0	18.06	7.273	4.136	82.453	22.222	1.436	209.917	0.940	0.929	41.420	-15.210	-113.671	14.903	10.785
10118	10100.0	20.83	7.291	4.240	83.405	21.787	1.312	121.476	0.950	2.734	41.416	27.850	-19.493	20.524	15.589
167	10100.0	20.84	7.282	4.192	83.100	21.650	1.365	131.336	0.946	2.603	41.418	22.974	-27.352	18.200	13.554
	10100.0	17.02	7.275	4.153	82.840	21.566	1.408	141.196	0.942	2.467	41.419	18.125	-36.671	16.064	11.741
	10200.0	17.43	7.271	4.123	82.633	21.514	1.441	151.057	0.939	2.325	41.420	13.300	-47.882	14.208	10.224
	10200.0	17.36	7.267	4.102	82.490	21.475	1.465	160.917	0.937	2.179	41.421	8.498	-58.713	12.760	9.089
	10200.0	17.60	7.265	4.091	82.417	21.433	1.477	170.776	0.936	2.030	41.421	3.714	-69.892	11.872	8.417
	10200.0	17.53	7.265	4.088	82.413	21.376	1.480	180.636	0.936	1.900	41.421	-1.054	-81.332	11.669	8.267
	10200.0	17.92	7.266	4.094	82.499	21.299	1.471	190.496	0.937	0.989	41.421	-5.811	-92.868	12.183	8.650
	10200.0	18.79	7.269	4.109	82.655	21.195	1.453	200.356	0.938	0.965	41.421	-10.562	-103.129	13.324	9.525
	10200.0	18.09	7.272	4.133	82.886	21.062	1.424	210.216	0.940	0.928	41.420	-15.313	-113.671	14.942	10.816
10168	10200.0	20.83	7.290	4.235	83.813	20.519	1.302	121.776	0.950	2.734	41.415	27.740	-19.656	20.470	15.541
117	10200.0	20.73	7.282	4.187	83.514	20.433	1.355	131.636	0.946	2.603	41.417	22.866	-27.541	18.150	13.511
	10200.0	17.89	7.275	4.148	83.254	20.385	1.398	141.496	0.942	2.466	41.419	18.018	-36.894	16.020	11.704
	10200.0	17.45	7.270	4.119	83.057	20.360	1.431	151.356	0.939	2.324	41.420	13.196	-47.882	14.171	10.195
	10200.0	17.36	7.266	4.098	82.917	20.339	1.454	161.216	0.937	2.177	41.421	8.395	-58.713	12.734	9.069
	10200.0	17.67	7.264	4.087	82.846	20.306	1.466	171.076	0.936	2.028	41.421	3.612	-69.892	11.859	8.408
	10200.0	17.53	7.264	4.084	82.837	20.251	1.469	180.936	0.936	1.900	41.421	-1.155	-81.332	11.672	8.270
	10300.0	17.93	7.265	4.090	82.930	20.167	1.460	190.796	0.937	0.989	41.421	-5.913	-92.868	12.201	8.664
	10300.0	18.04	7.268	4.106	83.086	20.049	1.442	200.656	0.938	0.965	41.420	-10.665	-103.129	13.354	9.549
	10300.0	18.12	7.272	4.130	83.315	19.894	1.413	210.516	0.940	0.927	41.419	-15.416	-113.671	14.981	10.848
ECATF	TIME	CV	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1



TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATE	TIME	EV SUM	OV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMD	VEL1	ALPHA1	PHI1	VINF1	DV1
10218	10200.0	22.75	7.285	4.231	84.213	19.244	1.293	121.075	0.950	2.734	41.415	27.629	-19.821	20.415	15.492
67	10200.0	20.15	7.281	4.133	83.925	19.209	1.346	131.935	0.945	2.602	41.417	22.757	-27.731	18.100	13.468
	10300.0	10.94	7.274	4.144	83.675	19.199	1.388	141.195	0.942	2.465	41.418	17.912	-37.119	15.975	11.667
	10400.0	17.44	7.263	4.114	83.477	19.200	1.421	151.655	0.939	2.322	41.419	13.091	-48.417	14.135	10.166
	10300.0	10.31	7.265	4.094	83.341	19.197	1.444	161.515	0.937	2.176	41.420	8.291	-61.965	12.708	9.049
	10300.0	15.06	7.264	4.083	83.273	19.174	1.455	171.375	0.936	2.026	41.421	3.510	-77.641	11.847	8.399
	10400.0	15.54	7.262	4.080	83.278	19.119	1.458	181.235	0.936	1.000	41.421	-1.257	-265.535	11.676	8.272
	10300.0	15.94	7.264	4.037	83.357	19.069	1.450	191.095	0.937	0.989	41.420	-6.015	-245.154	12.219	8.678
	10300.0	16.84	7.267	4.103	83.514	19.096	1.431	200.955	0.938	0.964	41.420	-10.767	-234.680	13.344	9.572
	10370.0	16.15	7.271	4.127	83.747	19.717	1.402	211.815	0.940	0.926	41.419	-15.519	-222.454	15.020	10.880
10269	10300.0	22.73	7.285	4.227	84.072	19.063	1.285	122.374	0.949	2.734	41.415	27.518	-19.987	20.361	15.444
17	10300.0	20.70	7.281	4.119	84.333	19.079	1.337	132.234	0.945	2.602	41.417	22.649	-27.923	18.150	13.425
	10300.0	15.9	7.275	4.143	84.075	19.067	1.379	142.094	0.942	2.464	41.418	17.806	-37.344	15.931	11.631
	10300.0	17.41	7.261	4.111	83.844	19.034	1.412	151.954	0.939	2.321	41.419	12.986	-48.687	14.099	10.137
	10300.0	10.27	7.267	4.099	83.761	19.056	1.435	161.814	0.937	2.174	41.420	8.188	-62.283	12.683	9.030
	10300.0	15.05	7.263	4.079	83.645	19.036	1.447	171.674	0.936	2.024	41.420	3.407	-77.997	11.836	8.391
	10300.0	15.54	7.263	4.077	83.733	19.067	1.446	181.534	0.936	1.999	41.420	-1.360	-265.172	11.680	8.275
	10400.0	15.96	7.264	4.034	83.864	19.065	1.440	191.394	0.937	0.988	41.420	-6.117	-248.858	12.238	8.692
	10400.0	16.06	7.267	4.100	83.94	19.736	1.421	201.254	0.938	0.963	41.419	-10.870	-234.389	13.415	9.596
	10400.0	15.10	7.271	4.124	84.165	19.533	1.392	211.114	0.940	0.925	41.418	-15.623	-222.211	15.060	10.913
10318	10300.0	20.65	7.284	4.223	84.222	19.617	1.277	121.573	0.949	2.733	41.415	27.407	-20.153	20.307	15.396
33	10300.0	20.66	7.285	4.175	84.734	19.744	1.329	132.533	0.945	2.601	41.416	22.540	-28.116	18.000	13.381
	10400.0	15.87	7.273	4.136	84.497	19.512	1.371	142.393	0.942	2.463	41.418	17.699	-37.573	15.887	11.593
	10400.0	17.36	7.261	4.107	84.300	19.667	1.404	152.253	0.939	2.320	41.419	12.881	-48.955	14.062	10.108
	10400.0	10.27	7.264	4.087	84.170	19.693	1.426	162.113	0.937	2.173	41.420	8.084	-62.603	12.658	9.010
	10400.0	15.04	7.263	4.076	84.116	19.693	1.438	171.973	0.936	2.023	41.420	3.304	-78.354	11.824	8.382
	10400.0	15.54	7.262	4.074	84.125	19.442	1.439	181.833	0.936	0.999	41.420	-1.463	-264.808	11.684	8.279
	10400.0	15.97	7.264	4.081	84.277	19.736	1.437	191.693	0.937	0.988	41.420	-6.220	-248.521	12.257	8.706
	10400.0	16.07	7.267	4.097	84.381	19.571	1.411	201.553	0.938	0.963	41.419	-10.974	-234.095	13.446	9.621
	10400.0	15.21	7.275	4.122	84.565	19.343	1.382	211.413	0.940	0.924	41.418	-15.728	-221.967	15.100	10.945
10368	10400.0	20.04	7.287	4.213	85.419	19.387	1.270	121.972	0.949	2.733	41.414	27.296	-20.320	20.252	15.348
63	10400.0	20.02	7.275	4.171	85.140	19.507	1.322	132.832	0.945	2.600	41.416	22.431	-28.310	17.950	13.338
	10400.0	10.03	7.272	4.133	84.904	19.614	1.364	142.692	0.942	2.462	41.417	17.592	-37.802	15.842	11.557
	10400.0	17.35	7.267	4.104	84.725	19.695	1.396	152.552	0.939	2.319	41.419	12.775	-48.233	14.026	10.079
	10400.0	10.26	7.264	4.034	84.894	19.744	1.413	162.412	0.937	2.171	41.419	7.979	-72.926	12.632	8.991
	10400.0	15.04	7.262	4.073	84.834	19.747	1.433	172.272	0.936	2.021	41.420	3.200	-78.713	11.813	8.374
	10400.0	15.54	7.262	4.071	84.844	19.695	1.431	182.132	0.936	0.999	41.420	-1.566	-264.442	11.689	8.282
	10300.0	15.95	7.263	4.076	84.620	19.363	1.422	191.937	0.937	0.987	41.419	-6.324	-248.185	12.276	8.721
	10300.0	16.91	7.265	4.095	84.760	19.461	1.403	201.852	0.938	0.962	41.419	-11.077	-233.809	13.477	9.646
	10300.0	15.25	7.277	4.125	85.005	19.347	1.373	211.712	0.941	0.923	41.418	-15.833	-221.724	15.140	10.978
ECATE	TIME	EV SUM	OV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMD	VEL1	ALPHA1	PHI1	VINF1	DV1

PLATE	TIME	CV	SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
10101	10170.0	21.58	*	7.284	4.210	83.072	22.095	1.353	127.620	0.947	2.652	41.417	24.796	-24.261	19.052	14.293
183	10170.0	19.87	*	7.278	4.164	82.773	21.980	1.397	137.480	0.943	2.513	41.419	19.936	-32.986	16.837	12.389
	10170.0	18.02	*	7.272	4.134	82.564	21.909	1.434	147.340	0.940	2.378	41.420	15.102	-43.439	14.862	10.752
	10270.0	16.73	*	7.267	4.110	82.345	21.860	1.461	157.200	0.938	2.233	41.421	10.292	-56.041	13.245	9.464
	10270.0	15.03	*	7.266	4.095	82.274	21.816	1.478	167.050	0.937	2.095	41.421	5.502	-70.888	12.129	8.610
	10270.0	13.53	*	7.265	4.082	82.208	21.765	1.484	176.920	0.936	1.935	41.422	0.728	-87.413	11.660	8.261
	10270.0	12.11	*	7.265	4.092	82.319	21.947	1.473	186.780	0.936	1.995	41.421	-4.033	-105.843	11.11	8.446
	10270.0	10.61	*	7.267	4.104	82.447	21.906	1.465	196.640	0.937	0.976	41.421	-8.786	-124.462	12.833	9.145
	10270.0	10.56	*	7.271	4.124	82.651	21.491	1.440	206.500	0.939	0.943	41.420	-13.535	-147.284	14.290	10.290
	10270.0	10.07	*	7.274	4.153	82.926	21.330	1.435	216.360	0.942	0.899	41.419	-18.287	-166.326	16.132	11.798
			*													
10135	10270.0	22.57	*	7.288	4.224	83.462	21.311	1.323	124.202	0.947	2.700	41.416	26.513	-21.522	19.873	15.013
150	10270.0	20.51	*	7.280	4.179	83.170	21.206	1.374	134.062	0.945	2.567	41.418	21.644	-29.735	17.594	13.033
	10270.0	18.57	*	7.274	4.142	82.925	21.144	1.414	143.922	0.941	2.429	41.419	16.803	-39.531	15.524	11.293
	10270.0	17.14	*	7.269	4.115	82.735	21.106	1.445	153.782	0.939	2.286	41.420	11.985	-51.330	13.765	9.872
	10270.0	16.12	*	7.264	4.097	82.612	21.072	1.465	163.642	0.937	2.139	41.421	7.188	-65.498	12.455	8.856
	10270.0	15.59	*	7.265	4.088	82.550	21.030	1.475	173.502	0.936	1.989	41.421	2.410	-81.472	11.744	8.323
	10270.0	15.03	*	7.265	4.087	82.542	20.988	1.475	183.362	0.936	0.998	41.421	-2.355	-98.665	11.740	8.320
	10270.0	14.11	*	7.266	4.096	82.633	20.941	1.464	193.222	0.937	0.984	41.421	-7.110	-117.657	12.438	8.843
	10270.0	13.11	*	7.265	4.113	82.858	20.764	1.442	203.082	0.939	0.956	41.420	-11.861	-138.664	13.725	9.840
	10270.0	12.50	*	7.273	4.139	83.178	20.616	1.411	212.942	0.941	0.916	41.419	-16.612	-160.955	15.448	11.230
			*													
10185	10270.0	22.25	*	7.287	4.220	83.871	20.055	1.314	124.501	0.949	2.700	41.416	26.403	-21.692	19.820	14.966
100	10270.0	20.27	*	7.280	4.174	83.584	19.997	1.364	134.361	0.945	2.567	41.417	21.537	-29.936	17.545	12.991
	10270.0	18.53	*	7.273	4.138	83.345	19.769	1.404	144.221	0.941	2.428	41.419	16.697	-39.765	15.461	11.258
	10270.0	17.11	*	7.269	4.111	83.166	19.955	1.435	154.081	0.939	2.285	41.420	11.881	-51.609	13.731	9.845
	10270.0	16.10	*	7.265	4.093	83.038	19.937	1.455	163.941	0.937	2.137	41.421	7.086	-68.735	12.433	8.839
	10270.0	15.56	*	7.264	4.084	82.988	19.902	1.464	173.802	0.936	1.987	41.421	2.308	-81.830	11.736	8.317
	10270.0	15.53	*	7.264	4.094	83.013	19.840	1.464	183.661	0.936	0.998	41.421	-2.457	-98.630	11.748	8.325
	10270.0	15.12	*	7.265	4.092	83.113	19.744	1.453	193.521	0.937	0.984	41.420	-7.212	-117.632	12.460	8.860
	10270.0	14.13	*	7.268	4.110	83.254	19.610	1.431	203.381	0.939	0.956	41.420	-11.963	-138.386	13.758	9.866
	10270.0	13.54	*	7.273	4.137	83.536	19.436	1.399	213.241	0.941	0.915	41.419	-16.716	-160.723	15.489	11.264
			*													
10235	10370.0	22.21	*	7.287	4.216	84.277	18.792	1.305	124.801	0.948	2.699	41.416	26.292	-21.863	19.767	14.920
50	10370.0	20.23	*	7.275	4.170	83.996	18.783	1.355	134.661	0.944	2.566	41.417	21.429	-30.135	17.496	12.950
	10370.0	18.50	*	7.272	4.134	83.761	18.789	1.395	144.521	0.941	2.427	41.419	16.591	-40.001	15.439	11.223
	10370.0	17.09	*	7.268	4.107	83.560	18.799	1.425	154.381	0.939	2.283	41.420	11.776	-51.891	13.657	9.819
	10370.0	16.09	*	7.265	4.089	83.462	18.797	1.445	164.241	0.937	2.136	41.420	6.982	-66.063	12.410	8.822
	10370.0	15.57	*	7.263	4.086	83.414	18.769	1.454	174.101	0.936	1.985	41.421	2.205	-82.190	11.729	8.311
	10370.0	15.54	*	7.263	4.080	83.440	18.706	1.453	183.961	0.936	0.998	41.421	-2.559	-98.940	11.755	8.331
	10370.0	15.14	*	7.265	4.089	83.541	18.601	1.442	193.821	0.937	0.983	41.420	-7.315	-117.608	12.482	8.876
	10370.0	14.16	*	7.268	4.107	83.716	18.450	1.421	203.681	0.939	0.955	41.419	-12.067	-138.105	13.751	9.893
	10370.0	13.27	*	7.272	4.134	83.961	18.249	1.389	213.541	0.941	0.914	41.418	-16.820	-160.490	15.530	11.298
			*													
10285	10370.0	22.16	*	7.286	4.212	84.681	17.524	1.297	125.100	0.948	2.699	41.415	26.182	-22.035	19.713	14.873
0	10370.0	20.19	*	7.279	4.166	84.444	17.552	1.346	134.960	0.944	2.565	41.417	21.321	-30.336	17.448	12.908
	10370.0	18.46	*	7.272	4.130	84.174	17.604	1.386	144.820	0.941	2.426	41.418	16.485	-40.239	15.356	11.188
	10370.0	17.06	*	7.267	4.103	83.997	17.639	1.416	154.680	0.938	2.282	41.419	11.672	-52.175	13.664	9.792
	10370.0	16.07	*	7.264	4.085	83.883	17.651	1.436	164.540	0.937	2.134	41.420	6.879	-66.394	12.368	8.805
	10370.0	15.57	*	7.263	4.076	83.837	17.630	1.445	174.400	0.936	1.983	41.420	2.102	-82.552	11.721	8.306
	10470.0	15.06	*	7.263	4.077	83.864	17.566	1.444	184.260	0.936	0.998	41.420	-2.662	-98.590	11.764	8.337
	10470.0	14.16	*	7.264	4.086	83.965	17.452	1.432	194.120	0.937	0.983	41.420	-7.417	-117.683	12.504	8.893
	10470.0	13.19	*	7.267	4.104	84.139	17.282	1.411	203.980	0.939	0.954	41.419	-12.170	-138.832	13.825	9.919
	10470.0	12.07	*	7.272	4.132	84.383	17.055	1.379	213.840	0.941	0.913	41.418	-16.924	-160.258	15.572	11.333
			*													
ECATE	TIME	CV	SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
10335															
317	10430.0	22.11	7.285	4.208	85.441	16.252	1.289	125.399	0.948	2.699	41.415	26.072	-22.208	19.660	14.826
	10410.0	21.14	7.277	4.163	84.810	16.338	1.339	135.259	0.944	2.565	41.417	21.212	-30.537	17.399	12.866
	10420.0	18.42	7.271	4.126	84.580	16.424	1.376	145.119	0.941	2.425	41.418	16.378	-40.475	15.354	11.153
	10430.0	17.03	7.267	4.099	84.412	16.474	1.408	154.979	0.938	2.281	41.419	11.567	-52.460	13.630	9.766
	10440.0	16.05	7.264	4.082	84.307	16.502	1.427	164.833	0.937	2.133	41.420	6.775	-66.727	12.367	8.789
	10450.0	15.56	7.262	4.073	84.257	16.523	1.436	174.699	0.936	1.981	41.420	1.999	-82.915	11.714	8.301
	10460.0	15.61	7.262	4.074	84.245	16.522	1.435	184.559	0.936	0.998	41.420	-2.765	-260.230	11.772	8.344
	10470.0	16.17	7.264	4.083	84.387	16.524	1.423	194.419	0.937	0.982	41.419	-7.521	244.358	12.527	8.911
	10480.0	17.21	7.267	4.102	84.763	16.513	1.402	204.279	0.939	0.953	41.419	-12.274	236.554	13.858	9.946
	10490.0	18.64	7.272	4.127	84.801	16.554	1.370	214.139	0.941	0.912	41.418	-17.029	219.026	15.614	11.367
10365															
267	10450.0	22.06	7.285	4.204	85.479	14.977	1.282	125.598	0.948	2.698	41.415	25.961	-22.382	19.607	14.779
	10460.0	20.10	7.277	4.159	85.212	15.111	1.332	135.558	0.944	2.564	41.416	21.104	-30.740	17.350	12.825
	10470.0	18.39	7.271	4.123	84.941	15.225	1.371	145.418	0.941	2.424	41.418	16.271	-40.720	15.112	11.119
	10480.0	17.01	7.264	4.096	84.823	15.307	1.400	155.278	0.936	2.279	41.419	11.461	-52.748	13.597	9.739
	10490.0	16.04	7.262	4.079	84.715	15.349	1.419	165.139	0.937	2.131	41.419	6.671	-66.062	12.345	8.773
	10500.0	15.56	7.262	4.070	84.674	15.342	1.428	174.998	0.936	1.980	41.420	1.896	-83.275	11.707	8.296
	10510.0	15.61	7.262	4.071	84.703	15.274	1.427	184.856	0.936	0.997	41.420	-2.868	259.865	11.781	8.350
	10520.0	16.19	7.262	4.081	84.805	15.139	1.415	194.718	0.937	0.982	41.419	-7.624	244.032	12.550	8.928
	10530.0	17.24	7.267	4.100	84.977	14.932	1.393	204.578	0.939	0.953	41.418	-12.378	236.278	13.893	9.973
	10540.0	18.67	7.271	4.128	85.217	14.649	1.361	214.436	0.941	0.910	41.417	-17.135	218.795	15.656	11.402
10435															
217	10510.0	22.02	7.284	4.201	85.874	13.699	1.276	125.997	0.948	2.698	41.415	25.850	-22.557	19.153	14.732
	10520.0	20.06	7.276	4.156	85.612	13.807	1.325	135.857	0.944	2.563	41.416	21.995	-30.945	17.311	12.783
	10530.0	18.35	7.270	4.120	85.395	14.032	1.364	145.717	0.941	2.423	41.417	16.164	-40.962	15.269	11.084
	10540.0	16.99	7.265	4.093	85.231	14.134	1.393	155.577	0.938	2.278	41.418	11.356	-53.036	13.563	9.713
	10550.0	16.02	7.262	4.076	85.126	14.195	1.412	165.437	0.937	2.129	41.419	6.566	-67.398	12.324	8.757
	10560.0	15.55	7.261	4.068	85.017	14.193	1.421	175.297	0.936	1.978	41.419	1.792	-83.646	11.701	8.291
	10570.0	15.62	7.261	4.069	85.115	14.123	1.419	185.157	0.936	0.997	41.419	-2.972	259.508	11.751	8.357
	10580.0	16.21	7.262	4.079	85.220	13.976	1.407	195.017	0.937	0.981	41.419	-7.728	243.707	12.573	8.946
	10590.0	17.27	7.264	4.098	85.392	13.751	1.385	204.877	0.939	0.952	41.418	-12.483	230.001	13.927	10.001
	10600.0	18.71	7.271	4.125	85.627	13.437	1.353	214.737	0.941	0.909	41.417	-17.240	218.563	15.659	11.438
10485															
167	10590.0	21.97	7.284	4.198	86.266	12.422	1.271	125.297	0.948	2.697	41.415	25.739	-22.733	19.500	14.685
	10600.0	20.02	7.276	4.153	86.007	12.552	1.319	135.156	0.944	2.562	41.416	20.886	-31.150	17.253	12.742
	10610.0	18.32	7.270	4.117	85.797	12.684	1.358	145.016	0.941	2.422	41.417	16.057	-41.207	15.227	11.049
	10620.0	16.99	7.265	4.090	85.636	12.808	1.387	154.876	0.938	2.276	41.418	11.250	-51.330	13.530	9.687
	10630.0	16.00	7.262	4.073	85.535	12.939	1.415	164.736	0.937	2.127	41.419	6.461	-67.737	12.303	8.741
	10640.0	15.53	7.261	4.065	85.438	12.943	1.414	174.596	0.936	1.976	41.419	1.688	-84.013	11.695	8.286
	10650.0	15.63	7.261	4.066	85.531	12.777	1.412	184.456	0.936	0.997	41.419	-3.076	259.145	11.800	8.365
	10660.0	16.23	7.263	4.077	85.632	12.514	1.400	194.316	0.937	0.981	41.419	-7.832	243.381	12.557	8.964
	10670.0	17.29	7.266	4.095	85.803	12.266	1.378	204.177	0.939	0.951	41.418	-12.588	229.724	13.962	10.028
	10680.0	18.74	7.271	4.123	86.038	11.926	1.346	214.036	0.941	0.908	41.417	-17.347	218.331	15.742	11.473
10535															
117	10670.0	21.92	7.282	4.195	86.665	11.145	1.266	125.596	0.948	2.697	41.414	25.627	-22.910	19.446	14.638
	10680.0	19.95	7.277	4.150	86.404	11.263	1.314	135.456	0.944	2.561	41.416	20.777	-31.357	17.204	12.701
	10690.0	18.28	7.269	4.114	86.195	11.384	1.353	145.316	0.941	2.421	41.417	15.950	-41.452	15.185	11.015
	10700.0	16.98	7.263	4.088	86.039	11.509	1.381	155.176	0.938	2.275	41.418	11.144	-53.623	13.457	9.661
	10710.0	16.00	7.262	4.071	85.940	11.633	1.399	165.036	0.936	2.124	41.419	6.356	-68.078	12.282	8.725
	10720.0	15.54	7.261	4.063	85.845	11.757	1.408	174.896	0.936	1.974	41.419	1.583	-84.382	11.689	8.282
	10730.0	15.63	7.261	4.064	85.939	11.815	1.406	184.756	0.936	0.997	41.419	-3.180	258.782	11.811	8.372
	10740.0	16.25	7.262	4.075	86.041	11.649	1.393	194.616	0.937	0.980	41.418	-7.937	243.056	12.622	8.983
	10750.0	17.32	7.263	4.095	86.211	11.382	1.371	204.476	0.939	0.950	41.418	-12.693	229.447	13.958	10.056
	10760.0	18.78	7.271	4.123	86.444	11.011	1.339	214.336	0.941	0.907	41.417	-17.453	218.100	15.785	11.509
ECATE	TTIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

FCAT#	TIME	CV	SUV	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
10585	10600.0	21.07	*	7.282	4.142	87.042	8.871	1.202	176.895	0.948	2.696	41.414	25.516	-23.088	19.393	14.591
67	10600.0	19.07	*	7.277	4.147	86.797	8.196	1.310	139.735	0.944	2.561	41.416	20.667	-31.565	17.155	12.659
	10600.0	19.07	*	7.265	4.112	86.541	8.451	1.348	146.615	0.940	2.419	41.417	15.842	-41.701	15.143	10.981
	10600.0	19.07	*	7.264	4.065	86.448	8.638	1.370	156.475	0.938	2.273	41.418	11.037	-53.915	13.464	9.635
	10600.0	19.07	*	7.261	4.063	86.343	8.728	1.394	166.335	0.936	2.124	41.418	6.251	-68.421	12.262	8.710
	10600.0	19.04	*	7.261	4.061	86.310	8.742	1.432	176.115	0.936	1.972	41.419	1.478	-84.753	11.684	8.278
	10600.0	19.04	*	7.261	4.053	86.345	8.663	1.450	186.055	0.936	0.997	41.419	-3.285	-98.419	11.821	8.380
	10600.0	19.04	*	7.262	4.073	86.447	8.468	1.388	196.915	0.937	0.980	41.418	-8.042	-112.730	12.646	9.002
	10600.0	19.05	*	7.262	4.073	86.515	8.197	1.365	206.775	0.939	0.949	41.418	-12.799	-128.171	14.023	10.085
	10600.0	19.02	*	7.271	4.123	86.847	8.796	1.333	216.635	0.942	0.905	41.416	-17.560	-143.868	15.829	11.545
10635	10700.0	21.03	*	7.282	4.140	87.147	8.630	1.250	127.194	0.947	2.696	41.414	25.403	-23.269	19.239	14.544
17	10700.0	19.03	*	7.274	4.145	87.143	8.971	1.306	137.054	0.944	2.560	41.416	20.557	-31.775	17.107	12.618
	10700.0	19.01	*	7.266	4.112	86.893	8.261	1.344	146.914	0.940	2.418	41.417	15.734	-41.951	15.101	10.946
	10700.0	19.07	*	7.264	4.063	86.734	8.463	1.372	156.774	0.938	2.272	41.418	10.931	-54.217	13.432	9.610
	10700.0	19.06	*	7.261	4.067	86.747	8.574	1.389	166.634	0.936	2.122	41.418	6.145	-68.766	12.241	8.694
	10700.0	19.03	*	7.266	4.059	86.712	8.592	1.397	176.494	0.936	1.970	41.419	1.373	-84.126	11.679	8.274
	10700.0	19.03	*	7.267	4.061	86.747	8.510	1.395	186.354	0.936	0.996	41.419	-3.390	-98.055	11.832	8.388
	10700.0	19.02	*	7.267	4.072	86.849	8.318	1.382	196.214	0.937	0.979	41.418	-8.147	-112.405	12.671	9.021
	10700.0	19.08	*	7.265	4.092	87.017	8.010	1.360	206.074	0.939	0.948	41.417	-12.905	-128.854	14.069	10.114
	10700.0	19.05	*	7.270	4.122	87.246	8.578	1.328	216.934	0.942	0.905	41.416	-17.667	-143.637	15.873	11.582
10685	10700.0	21.78	*	7.282	4.107	87.795	8.367	1.256	127.433	0.947	2.695	41.414	25.291	-23.445	19.286	14.497
33	10700.0	19.05	*	7.274	4.143	87.569	8.750	1.303	137.353	0.944	2.559	41.416	20.448	-31.986	17.058	12.577
	10700.0	19.13	*	7.268	4.107	87.373	8.074	1.340	147.213	0.940	2.417	41.417	15.626	-42.202	15.059	10.912
	10700.0	19.05	*	7.263	4.061	87.227	8.299	1.368	157.073	0.938	2.270	41.418	10.824	-54.517	13.359	9.584
	10700.0	19.04	*	7.261	4.055	87.137	8.423	1.385	166.933	0.935	2.120	41.418	6.039	-68.112	12.221	8.679
	10700.0	19.03	*	7.257	4.058	87.110	8.445	1.393	176.793	0.936	1.967	41.418	1.267	-84.500	11.674	8.271
	10700.0	19.06	*	7.260	4.060	87.147	8.358	1.390	186.653	0.936	0.996	41.418	-3.495	-98.690	11.844	8.397
	10700.0	19.03	*	7.262	4.071	87.243	8.154	1.376	196.513	0.937	0.979	41.418	-8.253	-112.079	12.657	9.041
	10700.0	19.41	*	7.265	4.092	87.415	7.825	1.355	206.373	0.939	0.948	41.417	-12.901	-128.618	14.106	10.143
	10700.0	19.03	*	7.270	4.121	87.642	8.362	1.323	216.233	0.942	0.904	41.416	-17.775	-143.406	15.917	11.619
10735	10800.0	21.73	*	7.281	4.185	88.172	8.110	1.254	127.792	0.947	2.694	41.414	25.179	-23.630	19.232	14.450
83	10800.0	19.01	*	7.274	4.141	87.952	8.535	1.300	137.652	0.943	2.558	41.415	20.337	-32.198	17.010	12.536
	10800.0	19.15	*	7.268	4.105	87.760	8.891	1.337	147.512	0.940	2.415	41.417	15.517	-42.455	15.017	10.878
	10800.0	19.02	*	7.263	4.060	87.618	8.139	1.364	157.372	0.938	2.269	41.417	10.716	-54.818	13.367	9.559
	10800.0	19.02	*	7.260	4.063	87.532	8.270	1.382	167.232	0.936	2.118	41.418	5.933	-68.461	12.202	8.664
	10800.0	19.03	*	7.259	4.056	87.506	8.301	1.389	177.092	0.936	1.965	41.418	1.161	-84.874	11.670	8.268
	10800.0	19.06	*	7.260	4.059	87.543	8.210	1.386	186.952	0.936	0.996	41.418	-3.601	-98.325	11.855	8.405
	10800.0	19.02	*	7.262	4.070	87.645	8.093	1.374	196.812	0.937	0.978	41.418	-8.359	-112.753	12.723	9.060
	10800.0	19.44	*	7.265	4.091	87.811	8.643	1.351	206.672	0.939	0.947	41.417	-12.918	-128.342	14.142	10.172
	10800.0	19.03	*	7.270	4.121	88.035	8.149	1.319	216.532	0.942	0.903	41.416	-17.883	-143.176	15.961	11.656
FCAT#	TIME	CV	SUV	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATE	TIME	DV SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMD	VEL1	ALPHA1 *	PHI1	VINF1	DV1
10469	10540.0	20.72 *	7.275	4.169	85.970 *	12.979	1.304	132.440	0.945	2.613	41.416	22.700	-27.830	18.073	13.444
183	10540.0	18.92 *	7.272	4.130	85.739 *	13.170	1.347	142.300	0.942	2.474	41.417	17.862	-37.222	15.954	11.649
	10540.0	17.42 *	7.267	4.100	85.557 *	13.311	1.379	152.160	0.939	2.331	41.418	13.047	-48.528	14.119	10.153
	10570.0	16.30 *	7.267	4.079	85.432 *	13.399	1.402	162.020	0.937	2.183	41.419	8.251	-62.085	12.697	9.041
	10580.0	15.66 *	7.261	4.068	85.370 *	13.426	1.414	171.880	0.936	2.032	41.419	3.472	-77.770	11.842	8.395
	10590.0	15.53 *	7.261	4.066	85.371 *	13.380	1.416	181.740	0.936	0.999	41.419	-1.294	-265.404	11.676	8.272
	10600.0	15.94 *	7.262	4.073	85.452 *	13.260	1.408	191.600	0.936	0.989	41.419	-6.053	-249.068	12.225	8.682
	10610.0	16.85 *	7.265	4.069	85.598 *	13.053	1.389	201.460	0.938	0.964	41.418	-10.808	-234.562	13.355	9.581
	10620.0	16.16 *	7.265	4.114	85.811 *	12.755	1.361	211.320	0.940	0.926	41.417	-15.564	-222.346	15.036	10.893
	10630.0	19.61 *	7.275	4.148	86.085 *	12.362	1.323	221.180	0.943	0.976	41.416	-20.328	-212.218	17.006	12.533
10502	10570.0	21.41 *	7.281	4.184	86.330 *	12.049	1.283	129.022	0.947	2.662	41.415	24.407	-24.899	18.867	14.132
150	10580.0	19.52 *	7.274	4.141	86.086 *	12.284	1.329	138.882	0.943	2.525	41.416	19.562	-33.721	16.672	12.251
	10590.0	17.91 *	7.262	4.108	85.887 *	12.467	1.365	148.742	0.940	2.383	41.418	14.740	-44.303	14.725	10.640
	10600.0	16.65 *	7.264	4.084	85.744 *	12.589	1.391	158.602	0.938	2.237	41.418	9.938	-57.046	13.141	9.383
	10610.0	15.83 *	7.261	4.069	85.660 *	12.647	1.407	168.462	0.936	2.087	41.419	5.154	-72.043	12.069	8.565
	10620.0	15.51 *	7.261	4.064	85.541 *	12.634	1.412	178.322	0.936	1.934	41.419	0.384	-88.636	11.651	8.254
	10630.0	15.74 *	7.261	4.068	85.692 *	12.536	1.408	188.182	0.936	0.994	41.419	-4.377	-254.666	11.954	8.478
	10640.0	16.48 *	7.263	4.080	85.813 *	12.352	1.393	198.042	0.937	0.974	41.418	-9.133	-239.415	12.921	9.213
	10650.0	17.66 *	7.267	4.102	86.091 *	12.073	1.368	207.902	0.939	0.941	41.418	-13.889	-226.390	14.414	10.390
	10660.0	19.20 *	7.272	4.133	86.252 *	11.693	1.333	217.762	0.942	0.895	41.416	-18.650	-215.569	16.283	11.924
10552	10620.0	21.37 *	7.281	4.181	86.720 *	10.787	1.278	129.321	0.947	2.661	41.415	24.297	-25.084	18.815	14.086
100	10630.0	19.48 *	7.273	4.139	86.480 *	11.066	1.324	139.182	0.943	2.524	41.416	19.453	-33.938	16.625	12.211
	10640.0	17.88 *	7.265	4.105	86.236 *	11.280	1.360	149.042	0.940	2.382	41.417	14.632	-44.562	14.685	10.608
	10650.0	16.62 *	7.264	4.082	86.146 *	11.424	1.385	158.901	0.938	2.235	41.418	9.832	-57.354	13.111	9.360
	10660.0	15.81 *	7.261	4.067	86.065 *	11.493	1.401	168.761	0.936	2.085	41.419	5.049	-72.355	12.052	8.552
	10670.0	15.51 *	7.260	4.062	86.048 *	11.483	1.406	178.621	0.936	1.932	41.419	0.279	-88.608	11.650	8.253
	10680.0	15.75 *	7.261	4.066	86.100 *	11.380	1.401	188.481	0.936	0.994	41.419	-4.482	-254.310	11.968	8.489
	10690.0	16.50 *	7.263	4.079	86.271 *	11.162	1.386	198.341	0.937	0.973	41.418	-9.238	-239.102	12.948	9.234
	10700.0	17.69 *	7.267	4.101	86.417 *	10.880	1.362	208.201	0.939	0.940	41.417	-13.995	-226.126	14.442	10.420
	10710.0	19.23 *	7.272	4.132	86.636 *	10.464	1.327	218.061	0.942	0.893	41.416	-18.757	-215.348	16.328	11.961
10602	10670.0	21.32 *	7.280	4.178	87.106 *	9.527	1.274	129.621	0.946	2.660	41.415	24.185	-25.269	18.763	14.041
50	10680.0	19.44 *	7.273	4.136	86.872 *	9.849	1.320	139.481	0.943	2.523	41.416	19.344	-34.156	16.578	12.171
	10690.0	17.84 *	7.267	4.103	86.682 *	10.096	1.355	149.341	0.940	2.380	41.417	14.525	-44.822	14.645	10.576
	10700.0	16.60 *	7.263	4.079	86.545 *	10.260	1.380	159.201	0.938	2.233	41.418	9.726	-57.663	13.081	9.337
	10710.0	15.86 *	7.261	4.065	86.467 *	10.340	1.396	169.061	0.936	2.083	41.419	4.944	-72.749	12.036	8.540
	10720.0	15.51 *	7.260	4.060	86.452 *	10.332	1.401	178.921	0.936	1.930	41.419	0.174	-89.380	11.649	8.253
	10730.0	15.76 *	7.261	4.064	86.505 *	10.224	1.396	188.781	0.936	0.993	41.419	-4.587	-253.954	11.963	8.500
	10740.0	16.52 *	7.264	4.077	86.675 *	10.012	1.381	198.641	0.937	0.973	41.418	-9.343	-238.789	12.977	9.256
	10750.0	17.72 *	7.267	4.105	86.815 *	9.687	1.356	208.501	0.939	0.939	41.417	-14.101	-225.863	14.450	10.451
	10760.0	19.27 *	7.272	4.132	87.057 *	9.242	1.321	218.361	0.942	0.892	41.416	-18.865	-215.128	16.373	12.000
10652	10720.0	21.28 *	7.280	4.176	87.490 *	8.271	1.271	129.920	0.946	2.660	41.415	24.074	-25.456	18.710	13.996
C	10730.0	19.40 *	7.272	4.134	87.260 *	8.636	1.316	139.780	0.943	2.522	41.416	19.235	-34.376	16.531	12.132
	10740.0	17.81 *	7.267	4.101	87.074 *	8.914	1.351	149.640	0.940	2.379	41.417	14.417	-45.085	14.605	10.543
	10750.0	16.58 *	7.263	4.077	86.941 *	9.099	1.376	159.500	0.937	2.232	41.418	9.619	-57.975	13.052	9.314
	10760.0	15.79 *	7.260	4.063	86.866 *	9.190	1.391	169.360	0.936	2.081	41.418	4.838	-73.105	12.020	8.528
	10770.0	15.51 *	7.260	4.058	86.853 *	9.183	1.396	179.220	0.936	1.928	41.419	0.069	-89.754	11.649	8.252
	10780.0	15.77 *	7.260	4.063	86.907 *	9.069	1.391	189.080	0.936	0.993	41.418	-4.692	-253.598	11.958	8.511
	10790.0	16.54 *	7.263	4.076	87.026 *	8.847	1.376	198.940	0.937	0.972	41.418	-9.449	-238.477	13.005	9.278
	10800.0	17.75 *	7.267	4.099	87.210 *	8.434	1.351	208.800	0.940	0.938	41.417	-14.208	-225.559	14.529	10.482
	10810.0	19.31 *	7.272	4.131	87.454 *	8.016	1.315	218.660	0.942	0.891	41.416	-18.973	-214.907	16.419	12.038
ECATE	TIME	DV SUM *	DV2	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMD	VEL1	ALPHA1 *	PHI1	VINF1	DV1

ECATE	TIME	CV	SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
10702	10710.0	21.23	*	7.275	4.174	87.862	7.049	1.269	130.219	0.946	2.659	41.414	23.962	-25.646	18.658	13.950
317	10720.0	19.35	*	7.272	4.132	87.646	7.427	1.313	140.079	0.943	2.521	41.416	19.125	-34.598	16.484	12.092
	10730.0	17.78	*	7.266	4.097	87.444	7.735	1.347	149.939	0.940	2.378	41.417	14.309	-45.349	14.565	10.511
	10800.0	15.55	*	7.262	4.075	87.334	7.941	1.372	159.799	0.937	2.230	41.418	9.513	-56.285	13.022	9.291
	10810.0	15.78	*	7.260	4.061	87.262	8.042	1.387	169.659	0.936	2.079	41.418	4.732	-73.462	12.004	8.516
	10820.0	15.51	*	7.259	4.057	87.251	8.036	1.392	179.519	0.936	1.000	41.418	-0.037	-265.870	11.648	8.252
	10830.0	15.78	*	7.260	4.061	87.305	7.916	1.386	189.379	0.936	0.993	41.418	-4.797	-253.241	12.013	8.523
	10840.0	16.56	*	7.262	4.075	87.425	7.675	1.371	199.239	0.937	0.972	41.418	-9.555	-238.164	13.034	9.300
	10850.0	17.79	*	7.266	4.098	87.607	7.303	1.346	209.099	0.940	0.937	41.417	-14.315	-225.336	14.567	10.513
	10860.0	19.35	*	7.272	4.131	87.847	6.791	1.311	219.959	0.943	0.890	41.416	-19.081	-214.687	16.465	12.077
10752	10820.0	21.14	*	7.275	4.172	88.239	5.808	1.267	130.518	0.946	2.658	41.414	23.850	-25.835	18.605	13.904
267	10830.0	17.52	*	7.272	4.130	88.027	6.223	1.310	140.378	0.942	2.520	41.416	19.015	-34.820	16.437	12.053
	10840.0	17.75	*	7.265	4.097	87.891	6.561	1.345	150.238	0.940	2.376	41.417	14.201	-45.615	14.526	10.480
	10850.0	15.53	*	7.262	4.074	87.724	6.787	1.369	160.098	0.937	2.223	41.418	9.406	-56.605	12.993	9.268
	10860.0	15.76	*	7.260	4.060	87.655	6.897	1.383	169.958	0.936	2.077	41.418	4.626	-73.821	11.988	8.504
	10870.0	15.51	*	7.255	4.055	87.646	6.893	1.388	179.818	0.936	1.000	41.418	-0.143	-265.494	11.649	8.252
	10880.0	15.79	*	7.260	4.060	87.701	6.766	1.383	189.678	0.936	0.992	41.418	-4.903	-252.884	12.029	8.535
	10890.0	15.53	*	7.262	4.075	87.820	6.510	1.367	199.538	0.937	0.971	41.418	-9.662	-237.851	13.063	9.323
	10900.0	17.81	*	7.266	4.098	88.001	6.114	1.342	209.398	0.940	0.936	41.417	-14.422	-225.073	14.607	10.545
	10910.0	19.39	*	7.272	4.131	88.240	5.569	1.307	219.258	0.943	0.889	41.416	-19.190	-214.466	16.512	12.115
10802	10870.0	21.14	*	7.275	4.170	88.614	4.573	1.265	130.817	0.946	2.657	41.414	23.738	-26.025	18.553	13.859
217	10880.0	19.29	*	7.271	4.128	88.409	5.025	1.302	140.677	0.942	2.519	41.416	18.905	-35.044	16.350	12.014
	10890.0	17.71	*	7.266	4.096	88.235	5.392	1.342	150.537	0.939	2.375	41.417	14.092	-45.883	14.487	10.448
	10900.0	15.51	*	7.262	4.072	88.111	5.637	1.366	160.397	0.937	2.227	41.418	9.298	-56.923	12.964	9.246
	10910.0	15.75	*	7.260	4.059	88.044	5.758	1.381	170.257	0.936	2.075	41.418	4.519	-74.183	11.973	8.493
	10920.0	15.51	*	7.255	4.054	88.038	5.754	1.385	180.117	0.936	1.000	41.418	-0.249	-265.115	11.649	8.253
	10930.0	15.81	*	7.260	4.060	88.093	5.620	1.379	189.977	0.936	0.992	41.418	-5.010	-252.527	12.045	8.547
	10940.0	15.61	*	7.262	4.074	88.212	5.348	1.364	199.837	0.937	0.970	41.417	-9.768	-237.539	13.053	9.345
	10950.0	17.84	*	7.266	4.098	88.392	4.929	1.339	209.697	0.940	0.935	41.417	-14.530	-224.810	14.646	10.577
	10960.0	19.43	*	7.272	4.131	88.628	4.350	1.304	219.557	0.943	0.887	41.416	-19.299	-214.247	16.558	12.155
10852	10920.0	21.09	*	7.275	4.168	88.985	3.347	1.264	131.116	0.946	2.657	41.414	23.626	-26.216	18.501	13.814
167	10930.0	19.25	*	7.271	4.127	88.786	3.834	1.307	140.976	0.942	2.518	41.416	18.795	-35.270	16.343	11.974
	10940.0	17.62	*	7.266	4.094	88.616	4.229	1.341	150.836	0.939	2.373	41.417	13.984	-46.153	14.447	10.416
	10950.0	15.49	*	7.262	4.071	88.495	4.493	1.364	160.696	0.937	2.225	41.417	9.191	-56.243	12.935	9.224
	10960.0	15.74	*	7.259	4.058	88.438	4.604	1.378	170.556	0.936	2.073	41.418	4.413	-74.543	11.958	8.481
	10970.0	15.51	*	7.259	4.054	88.426	4.620	1.382	180.417	0.936	1.000	41.418	-0.355	-266.737	11.650	8.253
	10980.0	15.62	*	7.260	4.059	88.482	4.479	1.377	190.276	0.936	0.992	41.418	-5.116	-252.169	12.062	8.560
	10990.0	16.63	*	7.262	4.074	88.601	4.191	1.361	200.136	0.938	0.970	41.417	-9.875	-237.227	13.122	9.369
	11000.0	17.88	*	7.266	4.098	88.779	3.748	1.336	209.996	0.940	0.934	41.417	-14.638	-224.548	14.686	10.609
	11010.0	19.47	*	7.272	4.131	89.013	3.135	1.302	219.856	0.943	0.886	41.415	-19.408	-214.027	16.605	12.194
10902	10970.0	21.05	*	7.272	4.167	89.354	2.130	1.264	131.416	0.946	2.656	41.414	23.514	-26.409	18.448	13.768
117	10980.0	19.21	*	7.271	4.125	89.160	2.652	1.307	141.276	0.942	2.517	41.416	18.685	-35.497	16.297	11.935
	10990.0	17.65	*	7.265	4.093	88.994	3.074	1.340	151.136	0.939	2.372	41.417	13.875	-46.424	14.408	10.385
	11000.0	16.46	*	7.262	4.070	88.877	3.356	1.363	160.996	0.937	2.223	41.417	9.083	-56.564	12.907	9.202
	11010.0	15.73	*	7.259	4.057	88.814	3.495	1.377	170.856	0.936	2.071	41.418	4.305	-74.910	11.943	8.470
	11020.0	15.51	*	7.255	4.053	88.811	3.492	1.380	180.716	0.936	1.000	41.418	-0.462	-268.357	11.651	8.254
	11030.0	15.83	*	7.260	4.059	88.868	3.343	1.375	190.576	0.936	0.991	41.418	-5.223	-251.811	12.079	8.573
	11040.0	16.65	*	7.262	4.074	88.986	3.040	1.359	200.436	0.938	0.969	41.417	-9.983	-236.915	13.153	9.392
	11050.0	17.91	*	7.266	4.098	89.163	2.572	1.334	210.296	0.940	0.933	41.416	-14.746	-224.286	14.726	10.641
	11060.0	19.51	*	7.272	4.132	89.401	1.905	1.299	220.156	0.943	0.885	41.415	-19.517	-213.808	16.652	12.234
ECATE	TIME	CV	SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATE	TIME	CV	SUM	*	CV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCF	RMID	VEL1	ALPHA1	*	PHI1	VINF1	DV1
				*				*								*			
10952	11020.0	**																	
67	11030.0	19.17	*		7.271	4.124	89.531	*	1.479	1.307	141.575	0.942	2.515	41.416	18.574	*	-35.725	16.250	11.896
	11040.0	17.62	*		7.265	4.092	89.379	*	1.927	1.339	151.435	0.939	2.370	41.417	13.766	*	-46.697	14.369	10.353
	11050.0	16.44	*		7.261	4.067	89.255	*	2.226	1.362	161.295	0.937	2.221	41.417	8.974	*	-59.888	12.878	9.180
	11060.0	15.72	*		7.255	4.056	89.195	*	2.374	1.375	171.155	0.936	2.069	41.418	4.197	*	-75.277	11.928	8.460
	11070.0	15.51	*		7.255	4.053	89.194	*	2.370	1.379	181.015	0.936	1.000	41.418	-0.569	*	267.976	11.653	8.256
	11080.0	15.85	*		7.260	4.058	89.251	*	2.214	1.373	190.875	0.936	0.991	41.418	-5.331	*	251.453	12.097	8.586
	11090.0	16.63	*		7.262	4.074	89.369	*	1.895	1.357	200.735	0.938	0.968	41.417	-10.091	*	236.603	13.183	9.416
	11100.0	17.94	*		7.266	4.098	89.544	*	1.404	1.332	210.595	0.940	0.932	41.416	-14.855	*	224.024	14.767	10.674
			*					*								*			
11062	11070.0	20.96	*		7.272	4.164	90.145	*	-0.477	1.266	132.014	0.946	2.654	41.414	23.294	*	-26.787	18.346	13.680
17	11080.0	19.12	*		7.271	4.123	89.809	*	0.601	1.307	141.874	0.942	2.513	41.416	18.455	*	-35.973	16.200	11.854
	11100.0	16.42	*		7.261	4.069	89.636	*	1.104	1.362	161.594	0.937	2.220	41.417	8.866	*	-60.214	12.850	9.158
	11110.0	15.71	*		7.255	4.056	89.573	*	1.261	1.375	171.454	0.936	2.067	41.418	4.090	*	-75.645	11.914	8.449
	11120.0	15.52	*		7.255	4.052	89.573	*	1.256	1.379	181.314	0.936	1.000	41.418	-0.677	*	267.594	11.655	8.257
	11130.0	15.86	*		7.260	4.058	89.632	*	1.088	1.372	191.174	0.936	0.991	41.418	-5.438	*	251.095	12.115	8.599
	11140.0	17.98	*		7.266	4.099	89.873	*	0.391	1.331	210.894	0.940	0.931	41.416	-14.969	*	223.751	14.809	10.709
	11150.0	17.53	*		7.272	4.133	90.267	*	-0.851	1.297	220.754	0.943	0.883	41.415	-19.727	*	213.391	16.743	12.310
			*					*								*			
11052	11120.0	20.91	*		7.278	4.163	90.451	*	-1.482	1.267	132.313	0.946	2.653	41.414	23.177	*	-26.992	18.292	13.633
	11140.0	17.56	*		7.265	4.090	90.186	*	-0.568	1.340	152.033	0.939	2.368	41.417	13.553	*	-47.231	14.294	10.293
	11150.0	16.40	*		7.261	4.068	90.039	*	-0.005	1.362	161.893	0.937	2.218	41.417	9.757	*	-60.542	12.822	9.137
	11160.0	15.76	*		7.255	4.055	89.907	*	0.273	1.375	171.753	0.936	2.065	41.418	3.978	*	-76.029	11.900	8.439
	11170.0	15.52	*		7.255	4.052	89.911	*	0.262	1.378	181.613	0.936	1.000	41.418	-0.788	*	267.198	11.658	8.259
	11180.0	15.87	*		7.260	4.059	90.016	*	-0.044	1.371	191.473	0.936	0.990	41.418	-5.545	*	250.739	12.133	8.613
	11190.0	16.72	*		7.262	4.074	90.219	*	-0.658	1.356	201.333	0.938	0.967	41.417	-10.298	*	236.007	13.243	9.462
	11200.0	18.01	*		7.267	4.100	90.247	*	-0.914	1.331	211.193	0.940	0.930	41.416	-15.073	*	223.501	14.849	10.741
	11210.0	19.63	*		7.273	4.134	90.520	*	-1.658	1.297	221.053	0.943	0.881	41.415	-19.849	*	213.150	16.756	12.355
			*					*								*			
11162	11170.0	20.87	*		7.277	4.163	90.809	*	-2.625	1.269	132.612	0.945	2.652	41.414	23.063	*	-27.190	18.239	13.588
83	11180.0	19.05	*		7.270	4.122	90.619	*	-1.945	1.309	142.472	0.942	2.511	41.416	18.240	*	-36.422	16.110	11.779
	11190.0	17.53	*		7.265	4.090	90.477	*	-1.455	1.341	152.332	0.939	2.366	41.417	13.436	*	-47.528	14.253	10.260
	11200.0	16.38	*		7.261	4.069	90.378	*	-1.123	1.363	162.192	0.937	2.216	41.417	8.649	*	-60.870	12.795	9.116
	11210.0	15.69	*		7.254	4.055	90.318	*	-0.939	1.375	172.052	0.936	2.063	41.418	3.873	*	-76.387	11.887	8.429
	11220.0	15.57	*		7.254	4.052	90.318	*	-0.929	1.378	181.912	0.936	1.000	41.418	-0.893	*	266.825	11.661	8.261
	11230.0	15.89	*		7.260	4.059	90.377	*	-1.116	1.371	191.772	0.936	0.990	41.418	-5.655	*	250.376	12.152	8.627
	11240.0	16.75	*		7.267	4.075	90.497	*	-1.495	1.356	201.632	0.938	0.966	41.417	-10.416	*	235.669	13.278	9.489
	11250.0	18.04	*		7.267	4.100	90.608	*	-2.057	1.331	211.492	0.940	0.929	41.416	-15.183	*	223.240	14.890	10.774
	11260.0	19.67	*		7.277	4.135	90.889	*	-2.835	1.297	221.352	0.943	0.880	41.415	-19.960	*	212.932	16.845	12.396
			*					*								*			
ECATE	TIME	CV	SUM	*	CV2	VINF2	PHI2	*	ALPHA2	VEL2	BETA	ECCF	RMID	VEL1	ALPHA1	*	PHI1	VINF1	DV1

ECATE	TIME	DV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
10836	10930.0	21.84	*	7.282	4.187	88.948	3.534	1.247	121.400	0.948	2.706	41.414	25.442	-23.205	19.357	14.560
183	10910.0	19.91	*	7.274	4.141	88.737	4.049	1.293	137.260	0.944	2.570	41.415	20.602	-31.688	17.126	12.635
	10920.0	18.23	*	7.268	4.105	88.549	4.481	1.330	147.120	0.940	2.427	41.416	15.783	-41.836	15.120	10.962
	10930.0	16.68	*	7.263	4.079	88.409	4.786	1.357	155.980	0.938	2.280	41.417	10.983	-54.069	13.447	9.622
	10940.0	15.95	*	7.260	4.062	88.322	4.962	1.375	165.840	0.936	2.130	41.418	6.200	-68.587	12.251	8.702
	10950.0	15.53	*	7.259	4.054	88.294	5.006	1.383	175.700	0.936	1.977	41.418	1.428	-84.929	11.861	8.276
	10960.0	15.04	*	7.259	4.056	88.328	4.918	1.381	186.560	0.936	0.997	41.418	-3.334	-258.246	11.826	8.383
	10970.0	16.27	*	7.261	4.067	88.423	4.690	1.369	196.420	0.937	0.980	41.418	-6.094	-242.570	12.658	9.011
	10980.0	17.36	*	7.265	4.088	88.580	4.311	1.347	206.280	0.939	0.949	41.417	-12.854	-229.026	14.051	10.099
	10990.0	18.84	*	7.270	4.118	88.795	3.772	1.316	216.140	0.942	0.906	41.416	-17.620	-217.738	15.853	11.565
10870	10940.0	20.56	*	7.276	4.156	89.056	3.075	1.277	133.842	0.945	2.620	41.415	22.300	-28.540	17.889	13.286
150	10950.0	18.79	*	7.270	4.117	88.867	3.544	1.317	143.702	0.941	2.479	41.416	17.475	-38.050	15.794	11.516
	10960.0	17.31	*	7.264	4.087	88.711	3.913	1.348	153.562	0.939	2.334	41.417	12.670	-49.506	13.989	10.050
	10970.0	16.23	*	7.261	4.066	88.605	4.147	1.369	163.422	0.937	2.184	41.418	7.881	-63.228	12.608	8.972
	10980.0	15.63	*	7.259	4.055	88.557	4.244	1.380	173.282	0.936	2.032	41.418	3.106	-75.038	11.802	8.366
	10990.0	15.54	*	7.259	4.054	88.569	4.204	1.381	183.142	0.936	0.999	41.418	-1.659	-264.114	11.852	8.284
	11000.0	15.99	*	7.260	4.062	88.642	4.021	1.373	193.002	0.936	0.987	41.418	-6.419	-247.873	12.253	8.734
	11010.0	16.93	*	7.263	4.079	88.776	3.687	1.355	202.862	0.938	0.961	41.417	-11.179	-233.525	13.507	9.669
	11020.0	18.28	*	7.268	4.106	88.969	3.191	1.327	212.722	0.940	0.922	41.416	-15.943	-221.467	15.182	11.012
	11030.0	19.95	*	7.274	4.142	89.216	2.519	1.290	222.582	0.944	0.871	41.415	-20.717	-211.469	17.177	12.678
10920	10990.0	20.52	*	7.276	4.154	89.425	1.872	1.276	134.141	0.945	2.619	41.415	22.188	-28.742	17.838	13.242
100	11000.0	18.75	*	7.265	4.115	89.241	2.373	1.316	144.001	0.941	2.478	41.416	17.365	-38.288	15.749	11.479
	11010.0	17.29	*	7.264	4.086	89.089	2.766	1.347	153.861	0.939	2.332	41.417	12.561	-49.792	13.952	10.021
	11020.0	16.21	*	7.261	4.065	88.986	3.015	1.367	163.721	0.937	2.182	41.418	7.773	-63.563	12.583	8.953
	11030.0	15.62	*	7.259	4.055	88.944	3.108	1.378	173.581	0.936	2.030	41.418	3.000	-75.405	11.792	8.358
	11040.0	15.55	*	7.259	4.053	88.953	3.077	1.379	183.441	0.936	0.999	41.418	-1.766	-263.736	11.698	8.289
	11050.0	16.01	*	7.260	4.062	89.027	2.884	1.371	193.302	0.936	0.987	41.418	-6.520	-247.526	12.314	8.750
	11060.0	16.96	*	7.263	4.079	89.161	2.537	1.353	203.161	0.938	0.960	41.417	-11.286	-233.227	13.540	9.695
	11070.0	18.31	*	7.269	4.106	89.357	1.992	1.325	213.021	0.941	0.921	41.416	-16.051	-221.218	15.224	11.047
	11080.0	19.99	*	7.274	4.142	89.599	1.290	1.288	222.881	0.944	0.870	41.415	-20.827	-211.260	17.226	12.719
10970	11040.0	**	*													
50	11050.0	18.71	*	7.269	4.114	89.613	1.211	1.316	144.301	0.941	2.477	41.416	17.255	-38.528	15.704	11.442
	11060.0	17.26	*	7.264	4.085	89.464	1.627	1.346	154.161	0.939	2.331	41.417	12.452	-50.079	13.916	9.992
	11070.0	15.19	*	7.261	4.065	89.364	1.891	1.366	164.021	0.937	2.181	41.418	7.665	-63.901	12.558	8.934
	11080.0	15.61	*	7.259	4.054	89.320	2.031	1.377	173.881	0.936	2.027	41.418	2.892	-79.785	11.762	8.351
	11090.0	15.55	*	7.259	4.053	89.335	1.956	1.378	183.741	0.936	0.999	41.418	-1.873	-263.358	11.704	8.293
	11100.0	16.03	*	7.262	4.062	89.409	1.754	1.369	193.601	0.936	0.986	41.418	-6.634	-247.179	12.336	8.766
	11110.0	16.98	*	7.263	4.079	89.545	1.374	1.351	203.461	0.938	0.960	41.417	-11.394	-232.930	13.574	9.721
	11120.0	20.04	*	7.274	4.143	89.970	0.091	1.287	223.181	0.944	0.868	41.415	-20.938	-211.050	17.275	12.761
11020	11090.0	20.43	*	7.276	4.152	90.270	-0.876	1.278	134.740	0.945	2.618	41.415	21.975	-29.128	17.741	13.159
0	11100.0	18.67	*	7.265	4.113	89.964	0.108	1.317	144.600	0.941	2.475	41.416	17.143	-38.773	15.658	11.404
	11110.0	17.22	*	7.264	4.084	89.721	0.846	1.346	154.460	0.939	2.328	41.417	12.332	-50.397	13.876	9.960
	11120.0	15.60	*	7.255	4.054	89.697	0.892	1.376	174.180	0.936	2.025	41.418	2.784	-81.161	11.772	8.343
	11130.0	15.56	*	7.255	4.053	89.713	0.843	1.377	184.040	0.936	0.999	41.418	-1.981	-262.978	11.711	8.298
	11140.0	17.01	*	7.263	4.080	89.866	0.403	1.350	203.760	0.938	0.959	41.417	-11.508	-232.617	13.610	9.750
	11150.0	18.38	*	7.268	4.107	90.194	-0.603	1.323	213.620	0.941	0.919	41.416	-16.262	-220.737	15.367	11.115
	11160.0	20.08	*	7.274	4.144	90.345	-1.111	1.286	223.480	0.944	0.867	41.415	-21.049	-210.841	17.325	12.803
ECATE	TIME	DV	SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1



TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATE	TTIME	CV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
11070	11140.0	20.39	7.275	4.151	90.598	-1.649	1.279	135.039	0.945	2.616	41.415	21.851	-29.354	17.685	13.111
317	11150.0	18.64	7.265	4.113	90.338	-1.057	1.318	144.899	0.941	2.474	41.416	17.033	-19.015	15.614	11.367
	11170.0	16.16	7.260	4.064	90.191	-0.568	1.366	164.619	0.937	2.177	41.418	7.456	-64.557	12.511	8.898
	11180.0	15.60	7.255	4.054	90.125	-0.366	1.376	174.479	0.936	2.023	41.418	2.681	-80.521	11.763	8.337
	11190.0	15.56	7.255	4.053	90.154	-0.451	1.377	184.339	0.936	0.999	41.418	-2.082	-262.621	11.718	8.303
	11200.0	16.06	7.260	4.062	90.234	-0.841	1.368	194.199	0.937	0.985	41.418	-6.838	-246.522	12.378	8.797
	11210.0	17.04	7.263	4.080	90.295	-0.899	1.350	204.059	0.938	0.958	41.417	-11.612	-232.334	13.643	9.775
	11220.0	18.42	7.262	4.108	90.489	-1.492	1.322	213.919	0.941	0.918	41.416	-16.381	-220.470	15.253	11.153
	11230.0	20.12	7.274	4.145	90.715	-2.305	1.286	223.779	0.944	0.866	41.415	-21.160	-210.631	17.374	12.846
11120	11150.0	20.34	7.275	4.151	90.872	-2.826	1.281	135.336	0.944	2.615	41.415	21.739	-29.559	17.634	13.068
267	11200.0	18.60	7.265	4.112	90.700	-2.184	1.319	145.198	0.941	2.473	41.416	16.922	-39.260	15.569	11.331
	11210.0	17.17	7.264	4.083	90.567	-1.716	1.348	155.058	0.938	2.326	41.417	12.123	-50.953	13.807	9.906
	11220.0	16.14	7.260	4.063	90.479	-1.422	1.367	164.918	0.937	2.175	41.418	7.339	-64.926	12.465	8.879
	11230.0	15.59	7.255	4.054	90.434	-1.279	1.377	174.778	0.936	2.021	41.418	2.567	-80.921	11.754	8.330
	11240.0	15.57	7.255	4.053	90.461	-1.355	1.377	184.638	0.936	0.998	41.418	-2.197	-262.218	11.725	8.309
	11250.0	16.08	7.260	4.062	90.538	-1.597	1.368	194.498	0.937	0.985	41.418	-6.958	-246.138	12.463	8.816
	11260.0	17.07	7.263	4.081	90.669	-2.021	1.350	204.358	0.938	0.957	41.417	-11.721	-232.037	13.677	9.803
	11270.0	18.46	7.262	4.109	90.850	-2.642	1.323	214.218	0.941	0.917	41.416	-16.491	-220.221	15.357	11.189
	11280.0	20.16	7.275	4.147	91.082	-3.469	1.286	224.078	0.944	0.864	41.415	-21.272	-210.423	17.424	12.888
11170	11240.0	20.39	7.275	4.150	91.227	-3.968	1.284	135.637	0.944	2.614	41.415	21.626	-29.766	17.583	13.024
217	11290.0	18.56	7.265	4.112	91.059	-3.292	1.321	145.497	0.941	2.471	41.416	16.811	-39.506	15.524	11.294
	11300.0	17.14	7.264	4.083	90.935	-2.830	1.349	155.357	0.938	2.324	41.417	12.014	-51.247	13.772	9.877
	11310.0	16.12	7.260	4.063	90.844	-2.507	1.368	165.217	0.937	2.173	41.418	7.230	-65.271	12.461	8.861
	11320.0	15.58	7.255	4.054	90.810	-2.385	1.378	175.077	0.936	2.019	41.418	2.459	-81.298	11.745	8.323
	11330.0	15.57	7.255	4.054	90.825	-2.426	1.378	184.937	0.936	0.998	41.418	-2.306	-261.835	11.733	8.315
	11340.0	16.07	7.260	4.063	90.905	-2.666	1.369	194.797	0.937	0.984	41.418	-7.067	-245.790	12.426	8.834
	11350.0	17.09	7.264	4.082	91.037	-3.135	1.351	204.657	0.938	0.957	41.417	-11.830	-231.740	13.712	9.831
	11360.0	18.49	7.266	4.110	91.275	-3.809	1.323	214.517	0.941	0.916	41.416	-16.601	-219.975	15.441	11.225
	11370.0	20.21	7.275	4.148	91.498	-4.672	1.287	224.377	0.944	0.863	41.415	-21.384	-210.214	17.475	12.931
11220	11290.0	20.20	7.275	4.150	91.579	-5.097	1.287	135.936	0.944	2.612	41.415	21.513	-29.975	17.533	12.981
167	11340.0	18.53	7.265	4.111	91.416	-4.401	1.324	145.797	0.941	2.470	41.416	16.699	-39.755	15.480	11.257
	11350.0	17.11	7.264	4.083	91.289	-3.897	1.351	155.656	0.938	2.322	41.417	11.903	-51.545	13.736	9.849
	11360.0	16.10	7.260	4.064	91.207	-3.582	1.370	165.516	0.937	2.171	41.418	7.121	-65.619	12.437	8.843
	11370.0	15.58	7.255	4.054	91.175	-3.457	1.379	175.376	0.936	2.016	41.418	2.350	-81.680	11.737	8.317
	11380.0	15.53	7.255	4.054	91.195	-3.515	1.379	185.236	0.936	0.998	41.418	-2.414	-261.454	11.741	8.321
	11390.0	16.11	7.261	4.064	91.271	-3.772	1.370	195.096	0.937	0.984	41.418	-7.176	-245.443	12.449	8.852
	11400.0	17.12	7.264	4.083	91.400	-4.233	1.352	204.956	0.938	0.956	41.417	-11.940	-231.443	13.748	9.859
	11410.0	18.53	7.265	4.112	91.580	-4.911	1.325	214.816	0.941	0.915	41.416	-16.712	-219.725	15.445	11.261
	11420.0	20.25	7.275	4.150	91.806	-5.825	1.289	224.676	0.944	0.862	41.415	-21.497	-210.006	17.525	12.974
11270	11390.0	22.18	7.283	4.197	92.114	-7.141	1.246	125.376	0.948	2.749	41.414	26.232	-21.953	19.736	14.893
117	11440.0	20.21	7.275	4.149	91.928	-6.210	1.270	135.236	0.944	2.611	41.415	21.400	-30.185	17.442	12.937
	11450.0	18.49	7.265	4.111	91.769	-5.489	1.327	145.096	0.941	2.468	41.416	16.587	-39.004	15.425	11.220
	11460.0	17.08	7.264	4.083	91.646	-4.970	1.354	154.956	0.938	2.320	41.417	11.792	-51.844	13.700	9.821
	11470.0	16.09	7.261	4.064	91.570	-4.656	1.372	164.816	0.937	2.169	41.418	7.012	-65.967	12.414	8.825
	11480.0	15.57	7.255	4.055	91.538	-4.518	1.381	174.676	0.936	2.014	41.418	2.241	-82.064	11.729	8.311
	11490.0	15.59	7.255	4.055	91.558	-4.580	1.381	184.536	0.936	0.998	41.418	-2.523	-261.072	11.750	8.327
	11500.0	16.13	7.261	4.065	91.634	-4.847	1.372	194.396	0.937	0.983	41.418	-7.286	-245.056	12.473	8.870
	11510.0	17.15	7.264	4.084	91.762	-5.326	1.353	204.256	0.938	0.955	41.417	-12.051	-231.147	13.784	9.887
	11520.0	18.57	7.265	4.113	91.941	-6.029	1.326	214.116	0.941	0.914	41.416	-16.824	-219.478	15.530	11.298
ECATE	TTIME	CV SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1



TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATE	TIME	DV SCV *	DVL	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMD	VEL1	ALPHA1 *	PHI1	VINF1	DV1
11203	11270.0	22.77	7.270	4.100	91.532	-5.031	1.270	132.220	0.946	2.664	41.414	23.322	-26.740	18.359	13.691
153	11270.0	19.14	7.271	4.124	91.355	-4.272	1.310	142.080	0.942	2.523	41.416	18.501	-35.878	16.219	11.870
	11280.0	17.00	7.265	4.192	91.222	-3.728	1.342	151.940	0.939	2.377	41.417	13.698	-46.866	14.345	10.334
	11300.0	15.43	7.261	4.107	91.120	-3.344	1.364	161.400	0.937	2.227	41.417	8.911	-60.079	12.862	9.167
	11310.0	15.71	7.255	4.056	91.063	-3.135	1.375	171.660	0.936	2.074	41.418	4.136	-75.488	11.920	8.454
	11330.0	15.52	7.259	4.053	91.062	-3.121	1.380	181.520	0.936	1.000	41.418	-0.631	-267.758	11.654	8.256
	11350.0	15.05	7.260	4.059	91.118	-3.303	1.374	191.380	0.936	0.991	41.418	-5.393	-251.246	12.107	8.593
	11340.0	15.67	7.262	4.105	91.224	-3.682	1.359	201.240	0.938	0.968	41.417	-10.155	-236.417	13.202	9.430
	11370.0	17.98	7.267	4.100	91.330	-4.271	1.335	211.100	0.940	0.932	41.417	-14.924	-223.855	14.752	10.695
	11390.0	17.57	7.273	4.134	91.650	-5.267	1.302	221.960	0.943	0.883	41.415	-19.702	-213.441	16.732	12.301
11237	11300.0	21.07	7.261	4.104	91.337	-5.131	1.290	124.802	0.947	2.713	41.414	25.020	-23.885	19.156	14.384
150	11310.0	19.75	7.273	4.130	91.634	-5.278	1.299	138.662	0.943	2.575	41.415	20.192	-32.480	16.946	12.482
	11320.0	18.10	7.267	4.103	91.501	-4.625	1.333	148.522	0.940	2.430	41.416	15.383	-42.768	14.966	10.836
	11370.0	15.79	7.262	4.077	91.384	-4.156	1.358	158.382	0.938	2.282	41.417	10.591	-55.172	13.329	9.530
	11340.0	15.91	7.260	4.100	91.321	-3.907	1.374	168.242	0.936	2.129	41.418	5.813	-69.853	12.180	8.648
	11350.0	15.52	7.259	4.053	91.301	-3.822	1.381	178.102	0.936	1.974	41.418	1.045	-86.289	11.666	8.265
	11360.0	15.67	7.255	4.056	91.329	-3.915	1.376	187.962	0.936	1.996	41.418	-3.719	-256.917	11.869	8.415
	11370.0	16.34	7.261	4.100	91.426	-4.250	1.367	197.822	0.937	0.978	41.418	-8.481	-241.382	12.753	9.083
	11390.0	17.47	7.264	4.090	91.559	-4.773	1.346	207.682	0.939	0.946	41.417	-13.247	-228.012	14.187	10.207
	11350.0	16.97	7.273	4.122	91.751	-5.522	1.310	217.542	0.942	0.901	41.416	-18.022	-216.881	16.019	11.703
11287	11300.0	21.02	7.281	4.103	92.182	-7.262	1.260	129.101	0.947	2.712	41.414	24.905	-24.076	19.102	14.337
100	11310.0	19.71	7.273	4.138	92.003	-6.378	1.302	138.961	0.943	2.573	41.415	20.079	-32.700	16.897	12.440
	11370.0	15.71	7.267	4.103	91.855	-5.705	1.336	148.821	0.940	2.429	41.417	15.272	-43.931	14.920	10.802
	11390.0	15.77	7.263	4.117	91.750	-5.291	1.361	158.681	0.938	2.280	41.417	10.482	-55.483	13.297	9.504
	11350.0	15.59	7.265	4.051	91.681	-4.965	1.376	168.542	0.936	2.127	41.418	5.704	-70.214	12.161	8.634
	11400.0	15.52	7.259	4.054	91.673	-4.881	1.383	178.401	0.936	1.972	41.418	0.935	-86.676	11.662	8.262
	11410.0	15.68	7.255	4.057	91.698	-4.938	1.380	188.261	0.936	0.995	41.418	-3.828	-256.543	11.862	8.425
	11420.0	15.37	7.261	4.070	91.748	-5.325	1.366	198.121	0.937	0.977	41.418	-8.590	-241.048	12.780	9.104
	11430.0	17.53	7.265	4.092	91.933	-5.968	1.345	207.981	0.939	0.945	41.417	-13.357	-227.730	14.225	10.238
	11440.0	18.01	7.271	4.123	92.120	-6.643	1.318	217.841	0.942	0.900	41.416	-18.134	-216.645	16.066	11.742
11337	11400.0	21.57	7.261	4.103	92.523	-6.376	1.264	129.401	0.947	2.711	41.414	24.790	-24.265	19.048	14.289
50	11410.0	19.67	7.273	4.138	92.347	-7.455	1.306	139.261	0.943	2.572	41.416	19.966	-32.922	16.847	12.398
	11420.0	18.03	7.267	4.103	92.205	-6.770	1.339	149.121	0.940	2.427	41.417	15.160	-43.295	14.862	10.768
	11430.0	16.74	7.265	4.077	92.105	-6.304	1.364	158.981	0.938	2.278	41.417	10.371	-55.798	13.265	9.479
	11440.0	15.63	7.267	4.051	92.038	-6.012	1.379	168.841	0.936	2.125	41.418	5.594	-70.578	12.142	8.619
	11450.0	15.52	7.255	4.055	92.021	-5.925	1.385	178.701	0.936	1.969	41.418	0.826	-87.065	11.659	8.260
	11460.0	15.69	7.260	4.058	92.007	-5.909	1.382	188.561	0.936	0.995	41.418	-3.937	-256.167	11.895	8.435
	11470.0	15.59	7.262	4.071	92.147	-6.307	1.371	198.421	0.937	0.976	41.418	-8.700	-240.714	12.908	9.126
	11480.0	17.53	7.265	4.093	92.292	-6.951	1.350	208.281	0.939	0.944	41.417	-13.468	-227.448	14.164	10.269
	11490.0	18.05	7.271	4.125	92.475	-7.752	1.321	218.141	0.942	0.899	41.416	-18.246	-216.410	16.112	11.781
11387	11400.0	21.52	7.261	4.103	92.853	-9.446	1.264	129.700	0.947	2.710	41.414	24.675	-24.455	18.993	14.242
0	11410.0	19.63	7.273	4.138	92.674	-10.534	1.310	139.560	0.943	2.571	41.416	19.853	-33.144	16.798	12.357
	11420.0	18.00	7.267	4.103	92.533	-7.821	1.343	149.420	0.940	2.426	41.417	15.048	-43.561	14.840	10.733
	11430.0	16.72	7.263	4.078	92.456	-7.344	1.367	159.280	0.938	2.276	41.418	10.261	-56.115	13.233	9.454
	11440.0	15.87	7.265	4.052	92.352	-7.046	1.382	169.140	0.936	2.123	41.418	5.484	-70.943	12.123	8.605
	11450.0	15.52	7.255	4.056	92.337	-6.966	1.388	179.000	0.936	1.967	41.418	0.716	-87.455	11.656	8.258
	11460.0	15.71	7.260	4.055	92.413	-7.264	1.385	188.860	0.936	0.995	41.418	-4.047	-255.790	11.909	8.445
	11470.0	15.41	7.255	4.072	92.503	-7.440	1.373	198.720	0.937	0.976	41.418	-8.811	-240.381	12.836	9.147
	11480.0	17.57	7.265	4.095	92.642	-8.022	1.353	208.580	0.939	0.943	41.417	-13.579	-227.166	14.303	10.301
	11490.0	18.07	7.271	4.127	92.827	-8.949	1.324	218.440	0.942	0.898	41.416	-18.358	-216.175	16.160	11.821
ECATE	TIME	DV SCV *	DVL	VINF2	PHI2 *	ALPHA2	VEL2	BETA	ECCE	RMD	VEL1	ALPHA1 *	PHI1	VINF1	DV1

EDATE	TIME	CV	SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
11437	1150.0	21.4	*	7.281	4.163	93.147	* -10.552	1.275	124.999	0.947	2.709	41.415	24.560	* -24.645	18.939	14.195
317	1150.0	17.51	*	7.277	4.159	93.034	* -9.589	1.315	134.954	0.943	2.569	41.416	19.739	* -23.368	16.749	12.315
	1150.0	17.97	*	7.267	4.104	92.992	* -8.897	1.347	149.719	0.940	2.424	41.417	14.936	* -42.829	14.758	10.699
	1150.0	18.50	*	7.263	4.179	92.855	* -8.310	1.371	155.579	0.938	2.274	41.418	10.150	* -56.434	13.201	9.429
	1150.0	18.83	*	7.26	4.163	92.743	* -8.086	1.386	164.439	0.936	2.120	41.418	5.374	* -71.310	12.104	8.591
	1150.0	19.52	*	7.256	4.157	92.727	* -7.980	1.391	170.299	0.936	1.964	41.418	0.606	* -87.845	11.654	8.256
	1150.0	19.72	*	7.260	4.060	92.768	* -8.115	1.388	189.159	0.936	0.995	41.418	-4.158	* 255.414	11.923	8.456
	1150.0	19.43	*	7.261	4.174	92.855	* -8.477	1.376	199.010	0.937	0.975	41.418	-8.922	* 240.048	12.865	9.170
	1150.0	19.67	*	7.266	4.137	92.913	* -9.070	1.356	209.979	0.939	0.942	41.417	-13.691	* 226.885	14.343	10.333
	1150.0	19.13	*	7.27	4.129	93.177	* -9.931	1.327	219.739	0.942	0.697	41.416	-18.471	* 215.940	16.207	11.860
11487	1150.0	11.43	*	7.281	4.164	93.533	* -11.613	1.281	131.298	0.947	2.708	41.415	24.445	* -24.836	18.885	14.147
267	1150.0	19.59	*	7.273	4.139	93.372	* -10.626	1.320	149.158	0.943	2.568	41.416	19.626	* -33.593	16.700	12.274
	1150.0	17.93	*	7.267	4.105	93.240	* -9.878	1.352	159.018	0.940	2.422	41.417	14.824	* -44.055	14.756	10.665
	1150.0	18.67	*	7.262	4.179	93.142	* -9.357	1.375	159.878	0.938	2.272	41.418	10.038	* -56.758	13.169	9.405
	1150.0	19.34	*	7.267	4.164	93.091	* -9.076	1.390	169.738	0.936	2.118	41.418	5.263	* -71.679	12.086	8.578
	1150.0	19.51	*	7.250	4.056	93.073	* -8.988	1.395	179.598	0.936	1.962	41.419	0.496	* -88.238	11.652	8.255
	1150.0	19.73	*	7.260	4.062	93.116	* -9.129	1.392	189.458	0.936	0.994	41.418	-4.268	* 255.037	11.938	8.467
	1150.0	19.43	*	7.260	4.076	93.216	* -9.504	1.380	199.318	0.937	0.975	41.418	-9.032	* 239.715	12.894	9.192
	1150.0	19.63	*	7.262	4.099	93.342	* -10.124	1.357	209.178	0.939	0.941	41.417	-13.803	* 226.605	14.383	10.365
	1150.0	19.17	*	7.272	4.132	93.523	* -11.060	1.330	219.038	0.942	0.895	41.416	-18.584	* 215.705	16.255	11.900
11537	1160.0	21.39	*	7.281	4.164	93.664	* -12.056	1.287	131.597	0.947	2.707	41.415	24.330	* -25.029	18.831	14.100
217	1160.0	19.51	*	7.273	4.140	93.738	* -11.643	1.320	141.457	0.943	2.567	41.416	19.512	* -33.820	16.651	12.233
	1160.0	17.93	*	7.267	4.105	93.579	* -10.984	1.357	151.317	0.940	2.420	41.417	14.712	* -44.370	14.714	10.632
	1160.0	18.64	*	7.263	4.060	93.488	* -10.353	1.380	161.177	0.938	2.270	41.418	9.926	* -57.081	13.127	9.380
	1160.0	19.83	*	7.261	4.165	93.435	* -10.067	1.394	171.037	0.936	2.116	41.418	5.152	* -72.049	12.068	8.564
	1160.0	19.51	*	7.260	4.059	93.425	* -9.983	1.399	179.897	0.936	1.959	41.419	0.385	* -88.631	11.651	8.254
	1160.0	19.74	*	7.260	4.063	93.453	* -10.130	1.396	189.757	0.936	0.994	41.419	-4.379	* 254.660	11.953	8.478
	1160.0	19.43	*	7.26	4.077	93.551	* -10.517	1.384	199.617	0.937	0.974	41.418	-9.144	* 239.383	12.923	9.215
	1160.0	19.65	*	7.257	4.101	93.687	* -11.154	1.363	209.477	0.939	0.940	41.417	-13.915	* 226.325	14.423	10.397
	1160.0	19.21	*	7.273	4.134	93.666	* -12.054	1.335	219.337	0.942	0.894	41.417	-18.698	* 215.472	16.303	11.940
11587	1160.0	21.33	*	7.281	4.165	94.192	* -13.680	1.293	131.896	0.947	2.706	41.415	24.214	* -25.222	18.777	14.053
167	1160.0	19.45	*	7.274	4.141	94.067	* -12.652	1.332	141.756	0.943	2.565	41.416	19.398	* -34.048	16.602	12.191
	1160.0	17.87	*	7.266	4.106	93.915	* -11.874	1.363	150.616	0.940	2.419	41.417	14.599	* -44.643	14.672	10.598
	1160.0	18.62	*	7.263	4.061	93.824	* -11.335	1.385	160.476	0.938	2.268	41.418	9.814	* -57.406	13.106	9.356
	1160.0	19.81	*	7.261	4.066	93.779	* -11.047	1.399	170.336	0.936	2.114	41.419	5.041	* -72.422	12.051	8.551
	1170.0	19.51	*	7.260	4.061	93.769	* -10.963	1.404	180.196	0.936	1.957	41.419	0.274	* -85.025	11.650	8.253
	1170.0	19.73	*	7.261	4.065	93.807	* -11.117	1.400	190.056	0.936	0.994	41.419	-4.490	* 254.283	11.969	8.490
	1170.0	19.53	*	7.263	4.070	93.895	* -11.515	1.388	199.917	0.937	0.973	41.418	-9.255	* 239.051	12.953	9.238
	1170.0	19.73	*	7.267	4.103	94.029	* -12.179	1.368	209.776	0.939	0.939	41.418	-14.028	* 226.045	14.464	10.430
	1170.0	19.25	*	7.272	4.137	94.276	* -13.094	1.339	219.636	0.942	0.893	41.417	-18.812	* 215.238	16.351	11.981
11637	1170.0	21.29	*	7.281	4.165	94.517	* -14.686	1.300	131.196	0.946	2.705	41.415	24.099	* -25.417	18.722	14.006
117	1170.0	19.47	*	7.274	4.141	94.370	* -13.639	1.338	141.056	0.943	2.564	41.417	19.284	* -34.278	16.553	12.150
	1170.0	17.83	*	7.267	4.107	94.243	* -12.848	1.368	150.916	0.940	2.417	41.418	14.486	* -44.918	14.631	10.564
	1170.0	18.67	*	7.264	4.083	94.143	* -12.301	1.390	160.776	0.938	2.266	41.418	9.702	* -57.733	13.075	9.332
	1170.0	19.80	*	7.261	4.068	94.114	* -12.012	1.404	170.636	0.936	2.111	41.419	4.930	* -72.796	12.034	8.539
	1170.0	19.51	*	7.260	4.062	94.110	* -11.930	1.408	180.496	0.936	1.954	41.419	0.163	* -85.420	11.649	8.253
	1170.0	19.76	*	7.261	4.067	94.149	* -12.091	1.405	190.356	0.936	0.993	41.419	-4.601	* 252.906	11.985	8.502
	1170.0	19.52	*	7.264	4.082	94.235	* -12.500	1.393	200.216	0.937	0.973	41.418	-9.367	* 238.720	12.983	9.261
	1170.0	19.73	*	7.264	4.106	94.368	* -13.172	1.372	210.076	0.940	0.938	41.418	-14.140	* 225.767	14.505	10.463
	1170.0	19.20	*	7.273	4.140	94.562	* -14.118	1.344	219.936	0.942	0.892	41.417	-18.926	* 215.005	16.400	12.022
EDATE	TIME	CV	SUM	CV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

TABLE XIV. - Continued. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECDF	TIME	SV SUM	SV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMD	VEL1	ALPHA1	PHI1	VINF1	DV1
11687	117.0.0	21.24	7.282	4.186	94.445	-15.672	1.308	131.495	0.946	2.704	41.416	23.983	-25.613	18.668	13.959
67	117.0.0	17.58	7.274	4.142	94.677	-14.609	1.345	141.355	0.943	2.562	41.417	19.170	-34.505	16.504	12.109
	117.0.0	17.67	7.265	4.104	94.555	-13.807	1.375	151.215	0.940	2.415	41.418	14.373	-45.194	14.590	10.531
	117.0.0	15.77	7.264	4.084	94.434	-13.253	1.395	161.775	0.938	2.264	41.419	9.590	-58.062	13.044	9.308
	117.0.0	15.73	7.261	4.064	94.455	-12.952	1.409	171.135	0.936	2.109	41.419	4.818	-73.171	12.017	8.526
	117.0.0	15.31	7.263	4.034	94.448	-12.833	1.414	181.795	0.936	1.952	41.419	0.052	-89.814	11.649	8.253
	117.0.0	15.73	7.261	4.003	94.447	-13.051	1.410	190.655	0.936	0.993	41.419	-4.713	-253.529	12.001	8.514
	117.0.0	15.55	7.264	4.004	94.573	-13.471	1.398	200.515	0.937	0.972	41.419	-9.479	-238.385	13.014	9.285
	117.0.0	17.78	7.261	4.132	94.708	-14.169	1.377	210.375	0.940	0.937	41.418	-14.253	-225.489	14.546	10.496
	117.0.0	17.39	7.274	4.142	94.876	-15.127	1.349	220.235	0.943	0.890	41.417	-19.040	-214.772	16.449	12.063
11737	117.0.0	21.14	7.282	4.187	95.163	-15.640	1.315	131.794	0.946	2.702	41.416	23.867	-25.810	18.614	13.912
17	117.0.0	19.34	7.274	4.143	95.022	-15.562	1.352	141.654	0.943	2.561	41.417	19.055	-34.742	16.455	12.068
	117.0.0	17.77	7.265	4.113	94.900	-14.743	1.381	151.714	0.940	2.413	41.418	14.260	-45.472	14.548	10.498
	117.0.0	15.55	7.264	4.085	94.825	-14.189	1.402	161.374	0.937	2.262	41.419	9.478	-58.393	13.014	9.284
	117.0.0	15.73	7.265	4.071	94.730	-13.876	1.415	171.234	0.936	2.107	41.419	4.706	-73.552	12.001	8.514
	117.0.0	15.31	7.261	4.007	94.782	-13.821	1.419	181.594	0.936	1.000	41.419	-0.060	-269.789	11.649	8.253
	117.0.0	15.79	7.265	4.071	94.822	-13.996	1.415	190.954	0.936	0.993	41.419	-4.824	-253.151	12.018	8.527
	117.0.0	15.57	7.264	4.036	94.838	-14.428	1.403	200.814	0.938	0.971	41.419	-9.592	-238.056	13.045	9.308
	117.0.0	17.57	7.265	4.111	95.037	-15.131	1.383	210.674	0.940	0.936	41.418	-14.367	-225.210	14.548	10.529
	117.0.0	17.39	7.274	4.145	95.207	-15.121	1.355	220.534	0.943	0.889	41.417	-19.155	-214.540	16.449	12.104
11787	117.0.0	21.15	7.282	4.187	95.478	-15.569	1.323	132.693	0.946	2.701	41.416	23.751	-26.008	18.560	13.865
33	117.0.0	19.34	7.274	4.145	95.344	-15.497	1.359	142.953	0.943	2.559	41.417	18.941	-34.975	16.407	12.027
	117.0.0	17.73	7.265	4.111	95.233	-15.675	1.386	152.813	0.940	2.411	41.418	14.146	-45.752	14.567	10.465
	117.0.0	15.53	7.264	4.087	95.153	-15.133	1.408	162.673	0.937	2.259	41.419	9.365	-58.726	12.983	9.261
	117.0.0	15.79	7.265	4.073	95.111	-14.785	1.421	172.533	0.936	2.104	41.419	4.594	-73.931	11.984	8.502
	117.0.0	15.31	7.261	4.005	95.114	-14.745	1.425	182.393	0.936	1.000	41.420	-0.172	-269.385	11.650	8.253
	117.0.0	15.33	7.267	4.074	95.155	-14.827	1.421	192.253	0.936	0.992	41.419	-4.936	-252.774	12.036	8.540
	117.0.0	17.57	7.265	4.059	95.233	-15.373	1.409	202.113	0.938	0.971	41.419	-9.705	-237.728	13.076	9.333
	117.0.0	17.39	7.263	4.114	95.367	-15.114	1.389	212.973	0.940	0.935	41.418	-14.481	-224.933	14.629	10.563
	117.0.0	17.39	7.274	4.147	95.535	-15.099	1.361	222.833	0.943	0.888	41.417	-19.270	-214.308	16.547	12.146
11837	117.0.0	21.14	7.282	4.189	95.743	-15.517	1.331	132.332	0.946	2.700	41.416	23.634	-26.207	18.506	13.818
43	117.0.0	19.34	7.274	4.146	95.602	-15.445	1.367	142.752	0.942	2.557	41.418	18.826	-35.211	16.358	11.987
	117.0.0	17.73	7.265	4.111	95.485	-15.706	1.395	152.112	0.940	2.409	41.419	14.033	-45.034	14.467	10.432
	117.0.0	15.53	7.265	4.087	95.471	-15.115	1.415	162.972	0.937	2.257	41.419	9.252	-59.061	12.953	9.238
	117.0.0	15.79	7.261	4.075	95.435	-15.700	1.427	172.832	0.936	2.102	41.420	4.481	-74.312	11.949	8.490
	117.0.0	15.31	7.265	4.073	95.444	-15.654	1.431	182.692	0.936	1.000	41.420	-0.284	-268.591	11.651	8.254
	117.0.0	15.33	7.265	4.075	95.484	-15.844	1.427	192.552	0.936	0.992	41.420	-5.049	-252.397	12.053	8.553
	117.0.0	17.57	7.265	4.071	95.567	-15.799	1.415	202.412	0.938	0.970	41.419	-9.818	-237.398	13.108	9.357
	117.0.0	17.39	7.274	4.117	95.694	-15.703	1.395	212.272	0.940	0.934	41.419	-14.595	-224.656	14.672	10.597
	117.0.0	17.39	7.274	4.152	95.853	-15.660	1.367	222.132	0.943	0.886	41.418	-19.385	-214.076	16.557	12.187

ECDF	TIME	SV SUM	SV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMD	VEL1	ALPHA1	PHI1	VINF1	DV1
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ECATE	TIME	CV	SLV	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1
11571	11600.0	20.0	*	7.284	4.203	94.146	* -13.769	1.275	127.130	0.948	2.757	41.415	26.025	* -22.281	19.637	14.806
183	11600.0	20.14	*	7.276	4.135	93.986	* -12.671	1.317	137.540	0.944	2.618	41.416	21.201	* -20.557	17.353	12.862
	11600.0	18.44	*	7.270	4.117	93.349	* -11.808	1.350	140.900	0.941	2.474	41.417	16.396	* -40.437	15.360	11.158
	11600.0	17.04	*	7.265	4.089	93.743	* -11.166	1.376	156.760	0.938	2.324	41.418	11.606	* -52.352	13.641	9.774
	11600.0	16.36	*	7.260	4.070	93.583	* -10.817	1.393	166.620	0.937	2.171	41.418	6.829	* -66.552	12.377	8.797
	11600.0	15.36	*	7.260	4.061	93.655	* -10.648	1.401	175.480	0.936	2.015	41.419	2.060	* -82.701	11.717	8.303
	11600.0	15.00	*	7.260	4.062	93.616	* -10.713	1.401	185.340	0.936	0.998	41.419	-2.705	* -260.437	11.766	8.339
	11700.0	16.16	*	7.262	4.072	93.745	* -11.017	1.392	195.200	0.937	0.983	41.418	-7.469	* -244.517	12.514	8.901
	11700.0	17.22	*	7.265	4.093	93.863	* -11.572	1.375	206.060	0.939	0.954	41.418	-12.238	* -230.647	13.346	9.936
	11700.0	18.63	*	7.271	4.123	94.025	* -12.388	1.349	215.920	0.941	0.912	41.417	-17.017	* -219.052	15.608	11.363
11604	11600.0	20.80	*	7.275	4.172	94.263	* -13.730	1.307	133.622	0.945	2.669	41.416	22.892	* -27.492	18.161	13.520
150	11600.0	19.00	*	7.272	4.131	94.119	* -12.764	1.343	143.482	0.942	2.526	41.417	18.081	* -36.758	16.344	11.724
	11600.0	17.40	*	7.266	4.099	94.004	* -12.046	1.371	153.342	0.939	2.378	41.418	13.286	* -47.912	14.201	10.219
	11700.0	16.55	*	7.263	4.077	93.923	* -11.567	1.391	163.202	0.937	2.226	41.418	8.505	* -61.308	12.759	9.088
	11700.0	15.68	*	7.261	4.064	93.890	* -11.438	1.402	174.662	0.936	2.071	41.419	3.734	* -76.865	11.371	8.417
	11700.0	15.53	*	7.260	4.062	93.893	* -11.313	1.405	182.922	0.936	1.000	41.419	-1.031	* -266.336	11.666	8.265
	11700.0	15.91	*	7.261	4.064	93.745	* -11.539	1.399	192.782	0.936	0.989	41.419	-5.795	* -249.914	12.178	8.646
	11700.0	15.79	*	7.264	4.086	94.044	* -12.009	1.385	202.642	0.938	0.965	41.418	-10.562	* -235.235	13.322	9.524
	11700.0	16.09	*	7.265	4.112	94.140	* -12.740	1.362	212.502	0.940	0.928	41.417	-15.338	* -222.878	14.950	10.823
	11700.0	17.73	*	7.275	4.148	94.316	* -13.747	1.332	222.362	0.943	0.878	41.416	-20.126	* -212.610	16.918	12.458
11654	11700.0	20.75	*	7.275	4.173	94.549	* -14.724	1.314	133.922	0.945	2.667	41.416	22.776	* -27.696	18.108	13.475
100	11700.0	19.96	*	7.272	4.132	94.449	* -13.742	1.349	143.781	0.942	2.525	41.417	17.967	* -36.959	15.597	11.685
	11700.0	17.45	*	7.267	4.100	94.337	* -13.013	1.377	153.641	0.939	2.376	41.418	13.174	* -48.201	14.162	10.188
	11700.0	16.33	*	7.262	4.078	94.260	* -12.527	1.396	163.501	0.937	2.224	41.419	8.393	* -61.650	12.732	9.067
	11700.0	15.67	*	7.261	4.066	94.229	* -12.298	1.408	173.361	0.936	2.069	41.419	3.623	* -77.249	11.859	8.408
	11700.0	15.53	*	7.265	4.103	94.233	* -12.262	1.410	183.721	0.936	1.000	41.419	-1.142	* -265.942	11.670	8.268
	11700.0	15.92	*	7.262	4.071	94.285	* -12.510	1.404	193.081	0.936	0.989	41.419	-5.907	* -246.547	12.158	8.662
	11700.0	15.81	*	7.265	4.088	94.383	* -12.993	1.390	202.941	0.938	0.965	41.418	-10.675	* -234.938	13.355	9.550
	11700.0	16.13	*	7.265	4.115	94.527	* -13.742	1.367	212.802	0.940	0.927	41.418	-15.451	* -222.612	14.953	10.858
	11700.0	17.76	*	7.275	4.151	94.711	* -14.773	1.337	222.561	0.943	0.877	41.417	-20.241	* -212.387	16.968	12.501
11704	11700.0	20.71	*	7.275	4.174	94.912	* -15.699	1.321	134.721	0.945	2.666	41.416	22.661	* -27.900	18.055	13.429
50	11700.0	18.92	*	7.272	4.133	94.777	* -14.702	1.356	144.081	0.942	2.523	41.417	17.853	* -37.242	15.950	11.646
	11700.0	17.42	*	7.267	4.101	94.668	* -13.963	1.383	153.941	0.939	2.375	41.418	13.061	* -48.452	14.123	10.157
	11700.0	16.51	*	7.262	4.079	94.593	* -13.472	1.402	163.801	0.937	2.222	41.419	8.281	* -61.954	12.705	9.046
	11800.0	15.66	*	7.261	4.064	94.565	* -13.244	1.413	173.661	0.936	2.067	41.419	3.512	* -77.634	11.846	8.398
	11800.0	15.53	*	7.261	4.065	94.570	* -13.231	1.415	183.521	0.936	1.000	41.419	-1.254	* -265.547	11.674	8.271
	11800.0	15.94	*	7.262	4.073	94.622	* -13.468	1.409	193.381	0.936	0.989	41.419	-6.019	* -245.180	12.218	8.677
	11800.0	16.84	*	7.265	4.090	94.720	* -13.962	1.395	203.241	0.938	0.964	41.419	-10.787	* -234.621	13.369	9.576
	11800.0	17.16	*	7.270	4.117	94.862	* -14.729	1.373	213.101	0.940	0.926	41.418	-15.564	* -222.347	15.037	10.894
	11800.0	17.62	*	7.276	4.154	95.043	* -15.783	1.342	222.961	0.944	0.875	41.417	-20.356	* -212.165	17.019	12.543
11754	11800.0	20.66	*	7.280	4.175	95.233	* -16.656	1.328	134.520	0.945	2.665	41.416	22.545	* -28.106	18.002	13.383
0	11800.0	19.86	*	7.273	4.134	95.101	* -15.646	1.363	144.380	0.942	2.521	41.417	17.739	* -37.486	15.903	11.607
	11800.0	17.39	*	7.267	4.103	94.996	* -14.898	1.390	154.240	0.939	2.373	41.418	12.948	* -48.785	14.085	10.126
	11800.0	15.29	*	7.263	4.081	94.924	* -14.402	1.408	164.100	0.937	2.220	41.419	8.169	* -62.335	12.677	9.026
	11800.0	15.65	*	7.261	4.069	94.898	* -14.175	1.419	173.960	0.936	2.064	41.419	3.400	* -78.021	11.834	8.389
	11800.0	15.54	*	7.261	4.067	94.904	* -14.166	1.421	183.820	0.936	0.999	41.419	-1.366	* -265.151	11.679	8.275
	11800.0	15.96	*	7.262	4.075	94.954	* -14.411	1.415	193.680	0.936	0.988	41.419	-6.131	* -248.814	12.239	8.693
	11800.0	16.67	*	7.265	4.093	95.053	* -14.918	1.400	203.540	0.938	0.963	41.419	-10.900	* -234.305	13.423	9.603
	11900.0	18.20	*	7.270	4.120	95.186	* -15.679	1.378	213.400	0.940	0.925	41.418	-15.679	* -222.080	15.061	10.930
	11900.0	19.86	*	7.277	4.157	95.372	* -16.777	1.348	223.260	0.944	0.874	41.417	-20.471	* -211.943	17.070	12.587
ECATE	TIME	CV	SLV	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCE	RMID	VEL1	ALPHA1	PHI1	VINF1	DV1

TABLE XIV. - Concluded. TABULAR DATA FOR TRAJECTORIES FROM 1.1 EARTH RADII CIRCULAR

## PARKING ORBIT TO 1.1 NEPTUNE RADII CIRCULAR PARKING ORBIT

ECATE	TIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCF	RMD	VEL1	ALPHA1	PHI1	VINF1	DV1
11804	11870.0	20.02	7.285	4.176	95.550	-17.595	1.335	134.819	0.945	2.663	41.417	22.430	-28.313	17.950	13.338
317	11870.0	16.84	7.275	4.135	95.423	-16.572	1.370	144.679	0.942	2.520	41.418	17.625	-37.732	15.856	11.568
	11870.0	17.36	7.267	4.104	95.321	-15.816	1.396	154.539	0.939	2.371	41.419	12.834	-45.075	14.046	10.095
	11900.0	16.27	7.264	4.063	95.252	-15.317	1.415	164.399	0.937	2.218	41.419	8.056	-52.687	12.651	9.005
	11910.0	15.64	7.262	4.071	95.228	-15.091	1.425	174.259	0.936	2.062	41.420	3.288	-58.409	11.822	8.381
	11920.0	15.54	7.261	4.069	95.235	-15.067	1.427	184.119	0.936	0.999	41.420	-1.478	-62.755	11.685	8.279
	11930.0	15.97	7.263	4.078	95.287	-15.358	1.420	193.979	0.937	0.988	41.419	-6.243	-64.447	12.261	8.709
	11940.0	16.99	7.265	4.095	95.383	-15.898	1.406	203.839	0.938	0.962	41.419	-11.013	-63.985	13.458	9.630
	11950.0	16.24	7.271	4.123	95.522	-16.684	1.384	213.697	0.941	0.924	41.418	-15.792	-62.818	15.125	10.966
	11950.0	15.91	7.277	4.101	95.697	-17.755	1.354	223.559	0.944	0.873	41.417	-20.587	-61.722	17.121	12.630
11854	11900.0	20.57	7.280	4.177	95.866	-18.515	1.344	135.110	0.945	2.662	41.417	22.314	-28.521	17.857	13.293
267	11900.0	16.87	7.273	4.137	95.742	-17.461	1.378	144.978	0.942	2.518	41.418	17.510	-37.975	15.809	11.529
	11940.0	17.33	7.266	4.106	95.643	-16.717	1.403	154.838	0.939	2.369	41.419	12.721	-45.376	14.308	10.065
	11950.0	15.65	7.264	4.055	95.577	-16.216	1.421	164.698	0.937	2.215	41.419	7.944	-50.036	12.524	8.985
	11950.0	15.63	7.262	4.073	95.547	-15.969	1.431	174.558	0.936	2.059	41.420	3.175	-55.801	11.811	8.372
	11970.0	15.54	7.262	4.072	95.564	-15.793	1.433	184.418	0.936	0.999	41.420	-1.590	-60.358	11.690	8.283
	11980.0	15.94	7.263	4.080	95.616	-16.254	1.427	194.278	0.937	0.987	41.420	-6.356	-60.081	12.283	8.726
	11990.0	16.97	7.266	4.098	95.711	-16.784	1.412	204.138	0.938	0.962	41.419	-11.126	-63.674	13.453	9.658
	12000.0	16.27	7.271	4.126	95.847	-17.549	1.390	213.998	0.941	0.923	41.418	-15.907	-62.554	15.169	11.002
	12010.0	15.95	7.277	4.104	95.925	-18.717	1.361	223.858	0.944	0.871	41.417	-20.703	-61.501	17.172	12.674
11904	11970.0	20.53	7.280	4.178	95.878	-19.416	1.355	135.417	0.945	2.661	41.417	22.197	-28.730	17.844	13.247
217	11970.0	17.76	7.273	4.138	95.755	-18.374	1.386	145.277	0.942	2.516	41.418	17.395	-38.228	15.763	11.491
	11980.0	15.76	7.265	4.107	95.693	-17.625	1.411	155.137	0.939	2.367	41.419	12.607	-45.674	13.770	10.034
	12000.0	15.23	7.264	4.086	95.649	-17.100	1.428	164.997	0.937	2.213	41.420	7.831	-50.387	12.558	8.965
	12010.0	15.65	7.262	4.075	95.671	-16.894	1.438	174.857	0.936	2.057	41.420	3.062	-55.193	11.800	8.364
	12020.0	15.55	7.262	4.074	95.695	-16.834	1.439	184.717	0.936	0.999	41.420	-1.702	-60.961	11.657	8.288
	12030.0	15.91	7.264	4.083	95.742	-17.153	1.433	194.577	0.937	0.987	41.420	-6.468	-60.715	12.305	8.742
	12040.0	16.95	7.267	4.101	95.836	-17.695	1.419	204.437	0.938	0.961	41.419	-11.240	-63.360	13.528	9.685
	12050.0	16.51	7.272	4.124	95.970	-18.526	1.397	214.297	0.941	0.921	41.419	-16.022	-62.291	15.214	11.039
	12060.0	15.67	7.277	4.105	96.143	-19.563	1.365	224.157	0.944	0.870	41.418	-20.819	-61.280	17.224	12.718
11954	12000.0	20.44	7.280	4.180	95.845	-20.300	1.361	135.716	0.945	2.659	41.417	22.081	-28.941	17.751	13.202
167	12000.0	15.77	7.274	4.140	95.722	-19.240	1.394	145.576	0.942	2.514	41.418	17.280	-38.478	15.716	11.452
	12010.0	15.27	7.265	4.107	95.650	-18.474	1.418	155.436	0.939	2.365	41.419	12.494	-45.974	13.732	10.004
	12020.0	15.21	7.265	4.089	95.619	-17.760	1.436	165.297	0.937	2.211	41.420	7.718	-50.741	12.572	8.945
	12030.0	15.67	7.267	4.078	95.643	-17.725	1.445	175.156	0.936	2.054	41.420	2.949	-55.586	11.789	8.356
	12040.0	15.95	7.263	4.077	95.673	-17.760	1.446	185.016	0.936	0.999	41.420	-1.815	-60.563	11.703	8.292
	12050.0	16.97	7.264	4.085	95.746	-18.035	1.443	194.876	0.937	0.986	41.420	-6.582	-60.350	12.328	8.760
	12060.0	16.95	7.267	4.104	95.857	-18.592	1.425	204.736	0.938	0.960	41.420	-11.354	-63.046	13.564	9.713
	12100.0	15.55	7.272	4.133	96.049	-19.437	1.404	214.599	0.941	0.920	41.419	-16.137	-62.028	15.260	11.076
	12110.0	15.54	7.277	4.111	96.257	-20.592	1.375	224.456	0.944	0.869	41.418	-20.935	-61.060	17.276	12.762
12004	12070.0	20.44	7.280	4.181	95.845	-21.105	1.370	136.016	0.945	2.658	41.418	21.965	-29.153	17.739	13.157
117	12070.0	15.67	7.274	4.142	95.725	-20.108	1.402	145.875	0.941	2.513	41.419	17.165	-38.730	15.700	11.414
	12080.0	15.24	7.265	4.111	95.650	-19.350	1.426	155.735	0.939	2.363	41.420	12.373	-45.276	13.854	9.974
	12100.0	15.17	7.265	4.091	95.623	-18.627	1.443	165.595	0.937	2.209	41.420	7.604	-50.096	12.546	8.926
	12110.0	15.61	7.265	4.080	95.641	-18.560	1.452	175.455	0.936	2.051	41.420	2.836	-55.980	11.779	8.349
	12120.0	15.56	7.265	4.079	95.662	-18.522	1.453	185.315	0.936	0.999	41.421	-1.928	-60.765	11.710	8.298
	12130.0	15.94	7.265	4.091	95.715	-18.977	1.444	195.175	0.937	0.986	41.420	-6.695	-60.985	12.351	8.777
	12140.0	16.91	7.266	4.107	95.816	-19.441	1.432	205.035	0.938	0.957	41.420	-11.468	-63.732	13.600	9.742
	12150.0	15.34	7.272	4.135	96.036	-20.332	1.411	214.896	0.941	0.919	41.419	-16.252	-62.076	15.305	11.113
	12160.0	15.67	7.277	4.113	96.271	-21.544	1.382	224.755	0.944	0.867	41.418	-21.052	-61.040	17.328	12.806
ECATE	TIME	DV SUM	DV2	VINF2	PHI2	ALPHA2	VEL2	BETA	ECCF	RMD	VEL1	ALPHA1	PHI1	VINF1	DV1





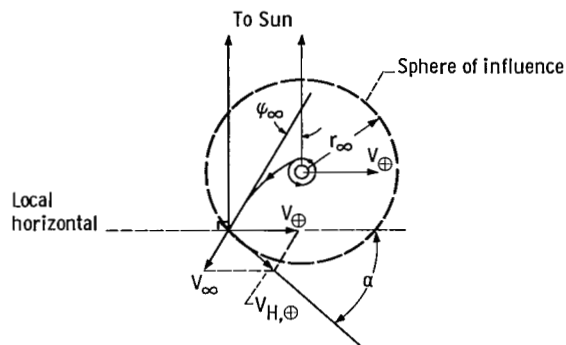


Figure 1. - Earth departure showing change from geocentric to heliocentric coordinates.

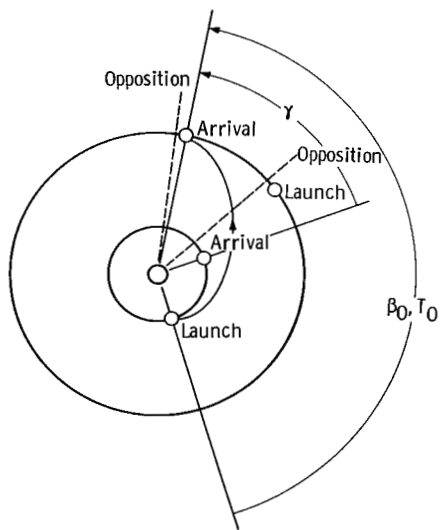


Figure 2. - Heliocentric legs of an outbound transfer with respect to an Earth-planet opposition.

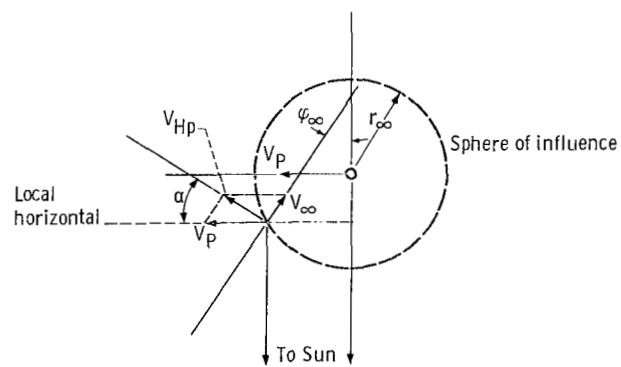


Figure 3. - Target planet encounter showing change from heliocentric to planetocentric coordinates.

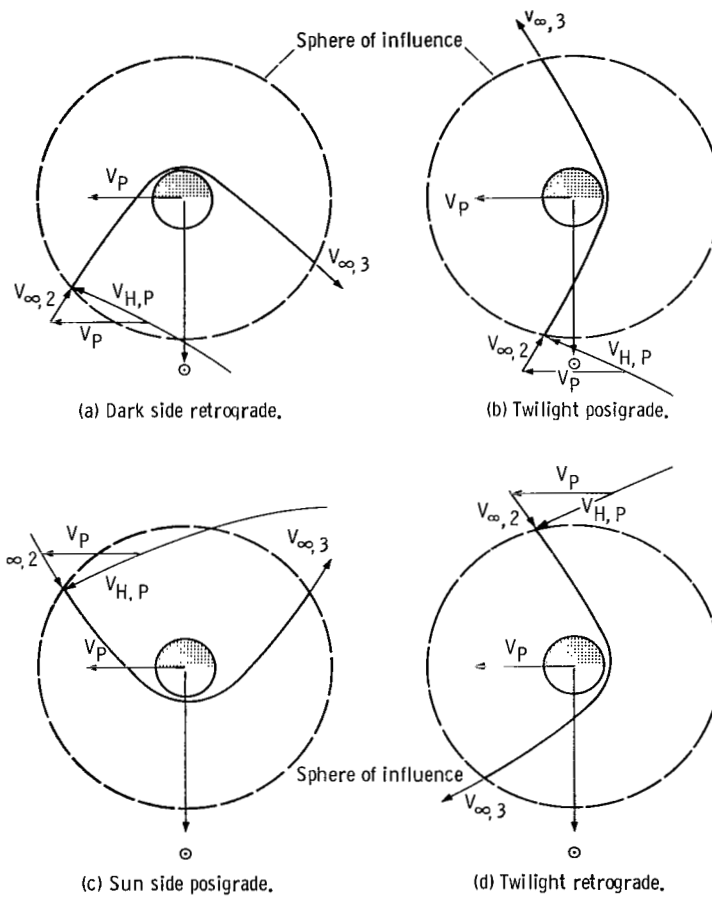
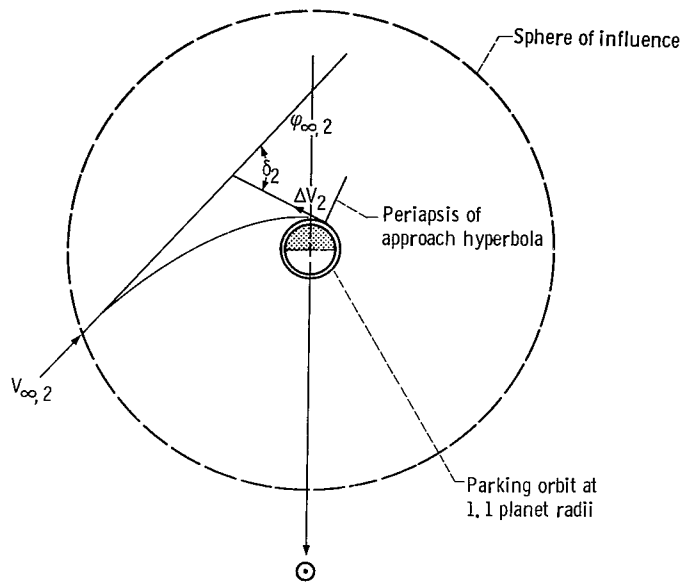
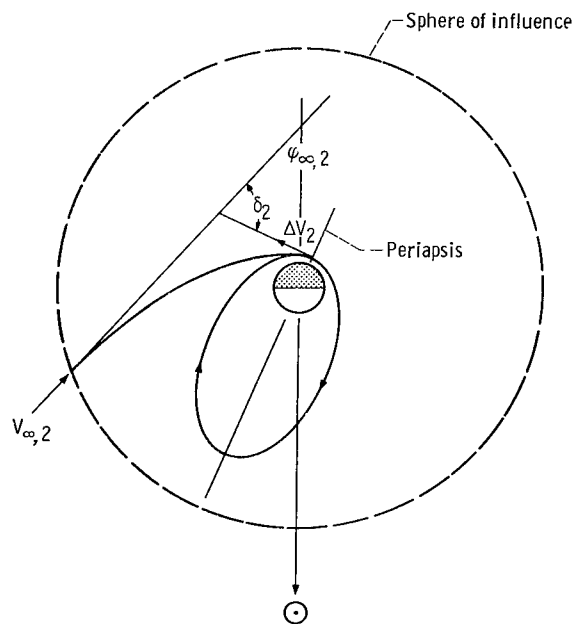


Figure 4. - Types of flyby trajectories.



(a) Reference low retrograde circular parking orbit.



(b) Elliptic parking orbit, retrograde orbit, and dark side periapsis.

Figure 5. - Parking orbits.

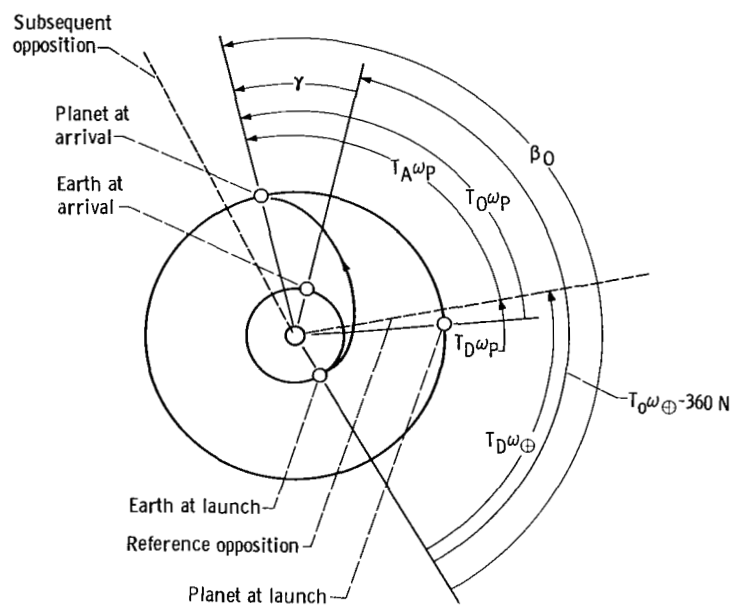


Figure 6. - Outbound mission profile.

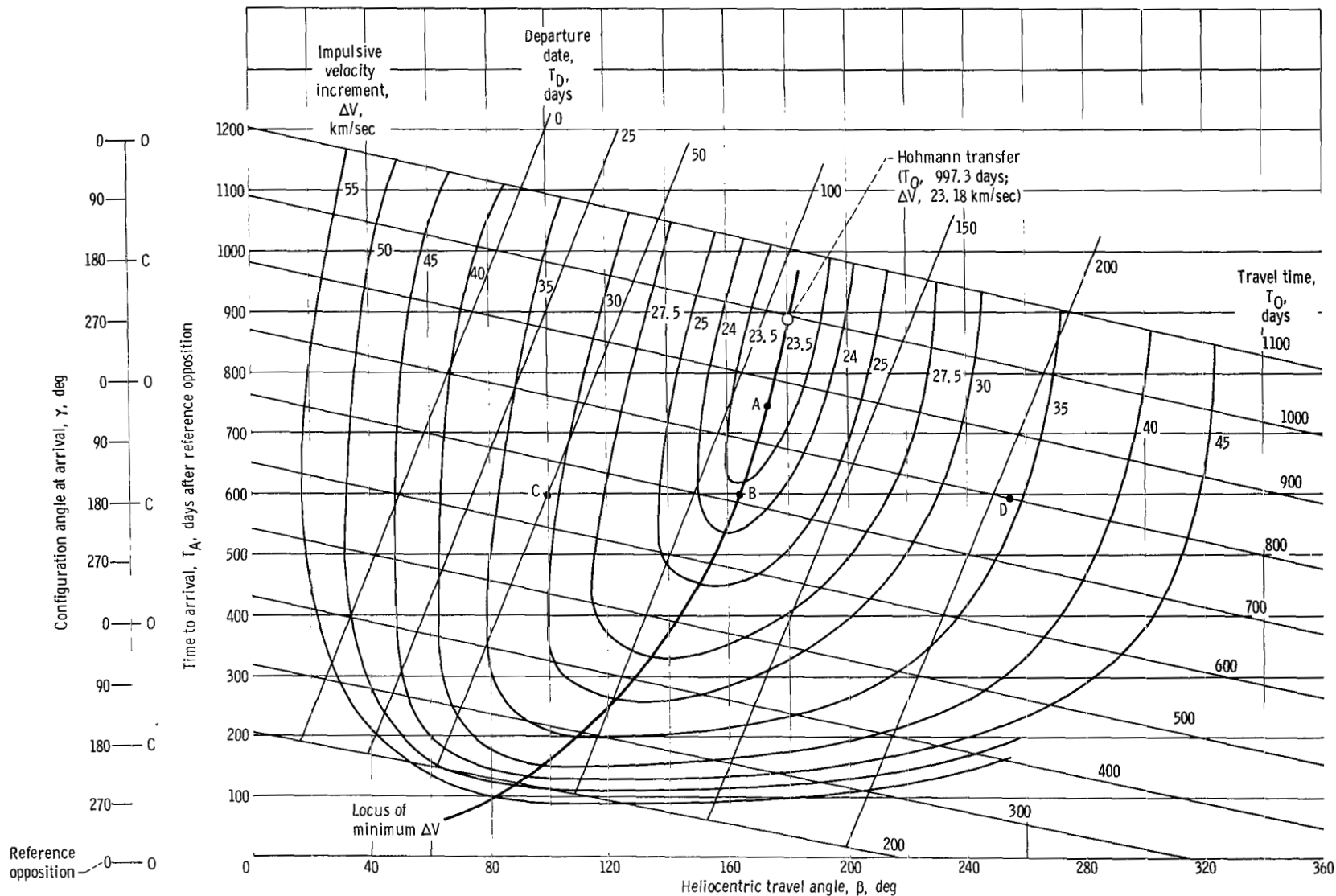


Figure 7. - Impulsive velocity increment  $\Delta V$  contour chart for Earth to Jupiter trajectories into a 1.1 planet radii circular parking orbit. (Opposition angle,  $0^\circ$ ; conjunction angle,  $C$ ,  $180^\circ$ .)

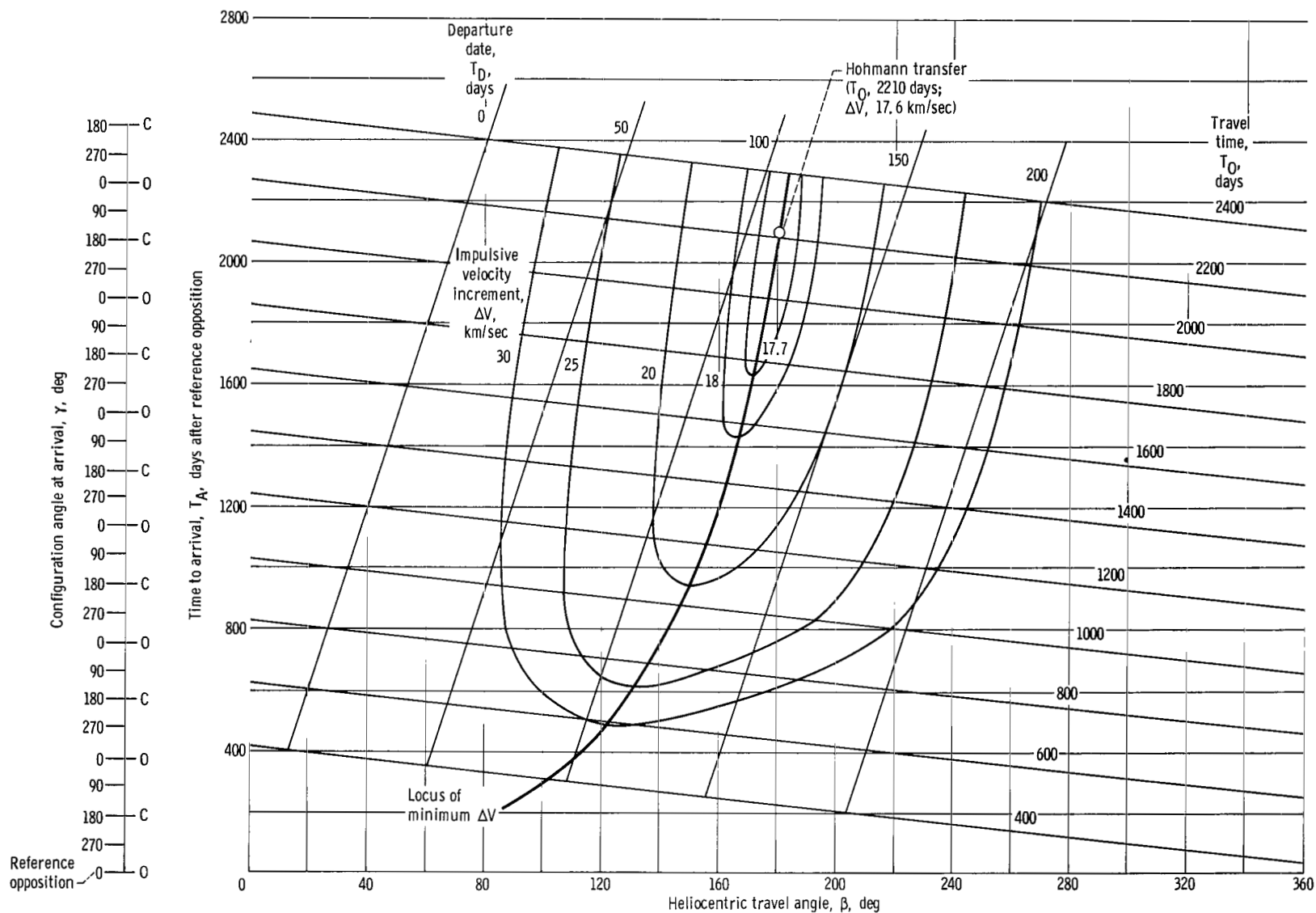


Figure 8. - Impulsive velocity increment  $\Delta V$  contour chart for Earth to Saturn trajectories into 1.1 planet radii circular parking orbit. (Opposition angle,  $0^\circ$ ; conjunction angle,  $C$ ,  $180^\circ$ .)

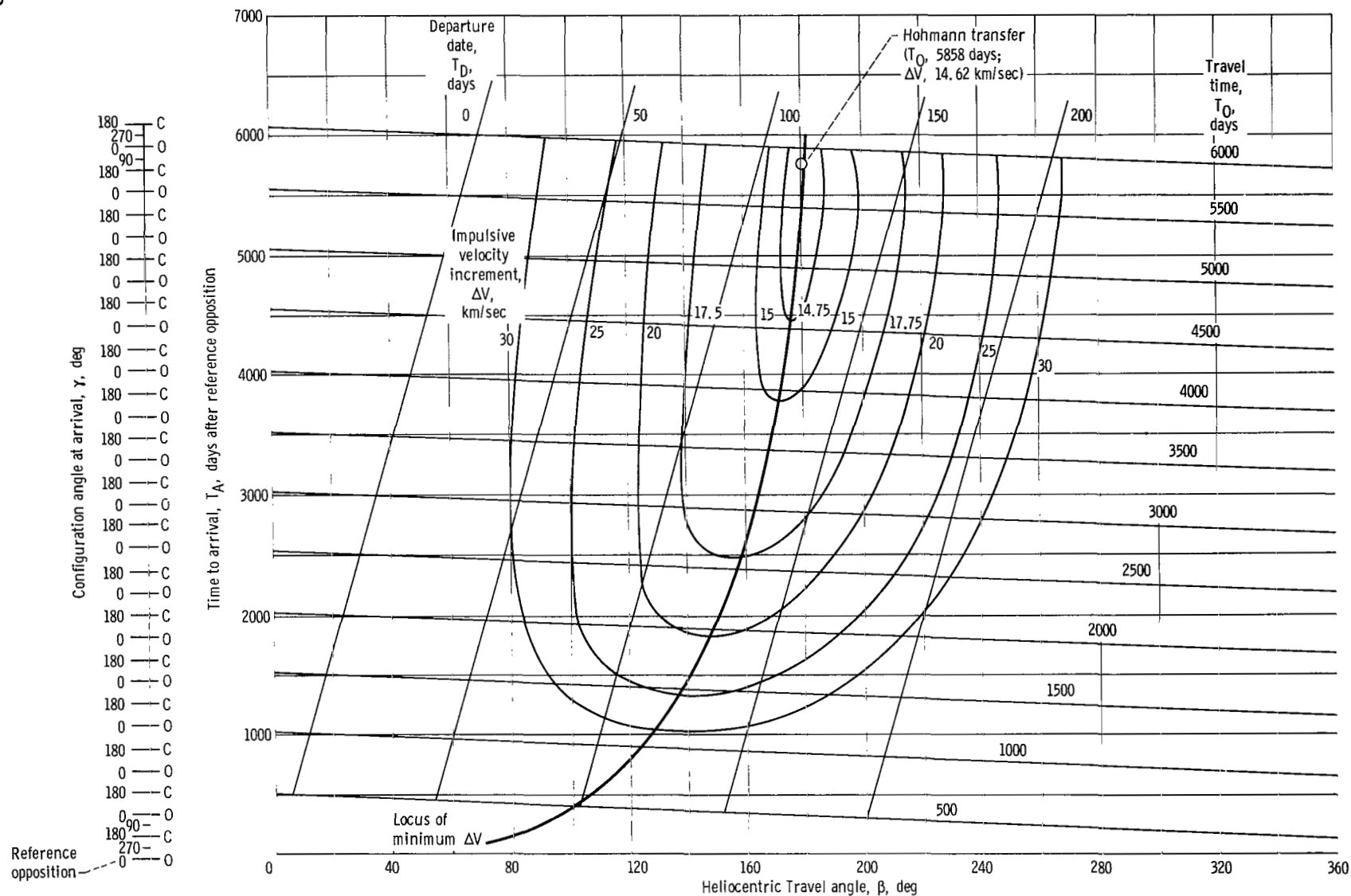


Figure 9. - Impulsive velocity increment  $\Delta V$  contour chart for Earth to Uranus trajectories into a 1.1 planet radii circular parking orbit. (Opposition angle,  $0^\circ$ ; conjunction angle,  $180^\circ$ .)





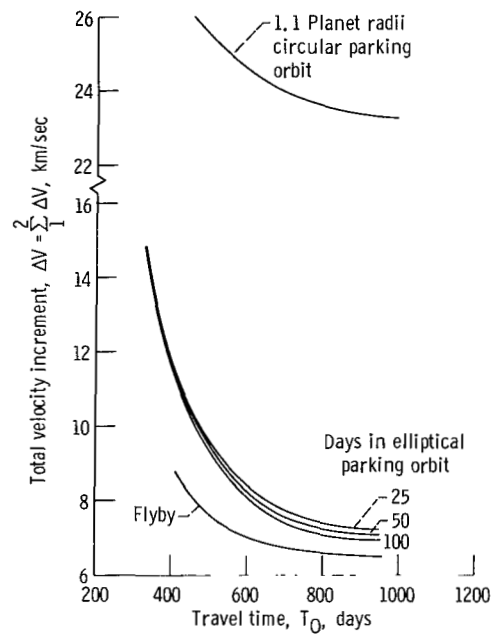


Figure 11. - One-way probe impulsive velocity requirements as function of travel time and parking orbit. Earth to Jupiter; periastris at 1.1 planet radii.

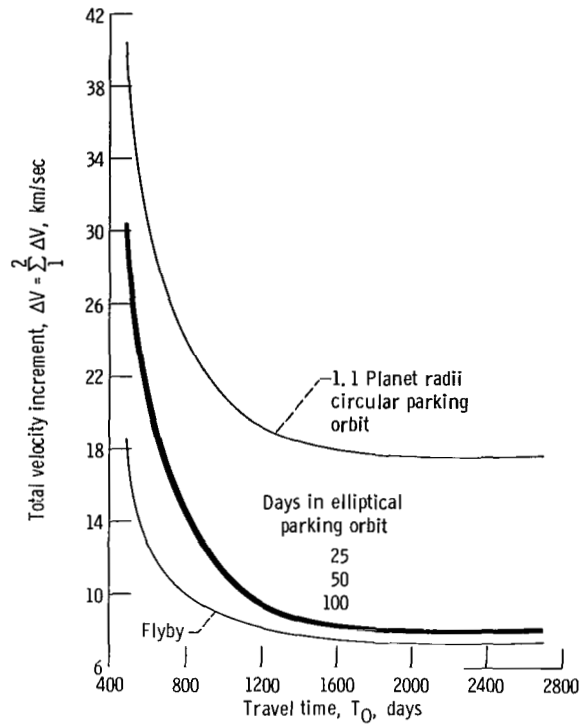


Figure 12. - One-way probe impulsive velocity requirements as function of travel time and parking orbit. Earth to Saturn; periaapsis at 1.1 planet radii.

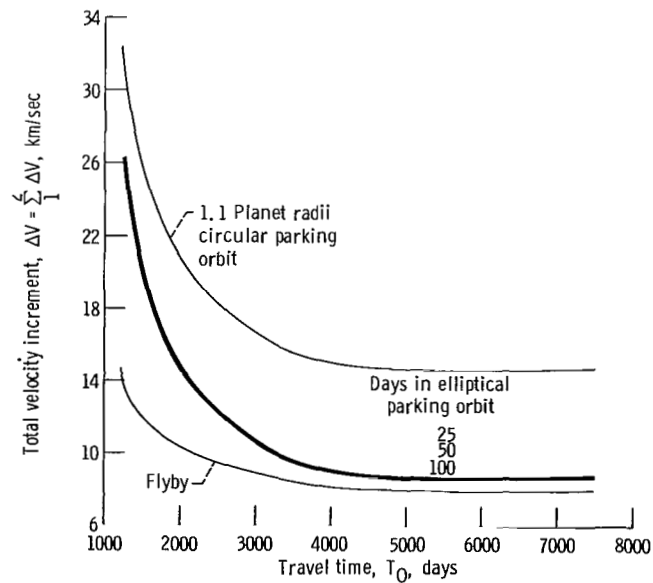


Figure 13. - One-way probe impulsive velocity requirements as function of travel time and parking orbit. Earth to Uranus; periaapsis at 1.1 planet radii.

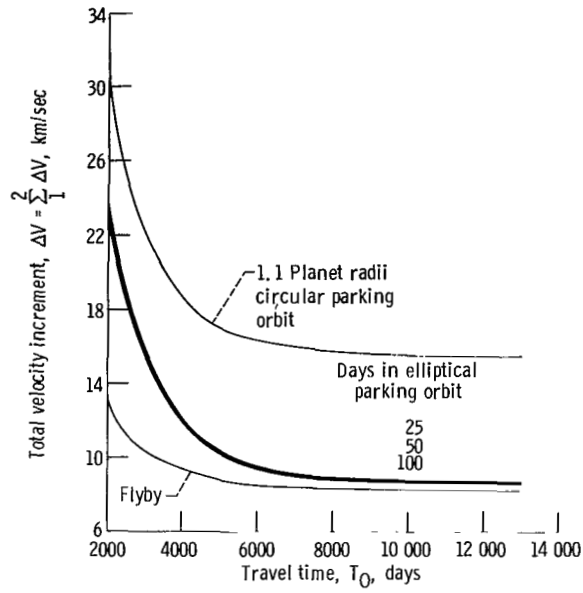


Figure 14. - One-way probe impulsive velocity requirements as function of travel time and parking orbit. Earth to Neptune; periapsis at 1.1 planet radii.

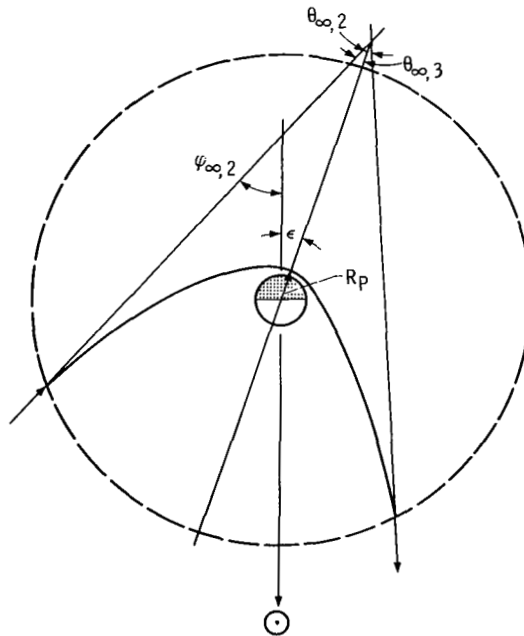


Figure 15. - Nonpropulsive flyby target planet encounter.

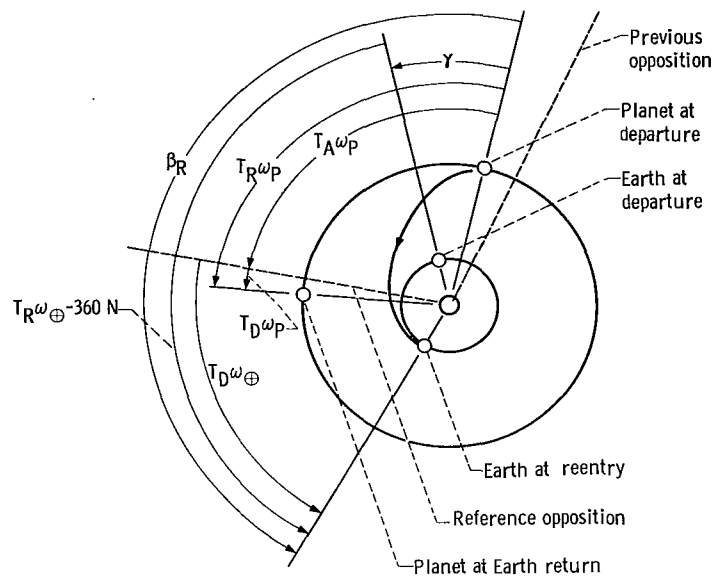


Figure 16. - Return mission profile.

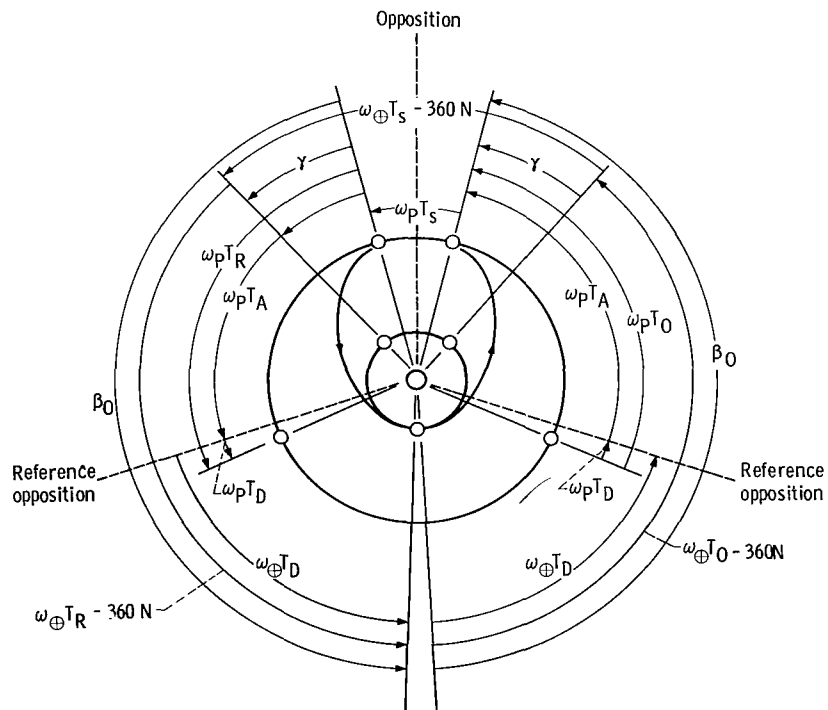
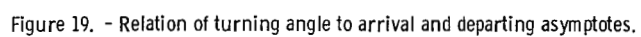
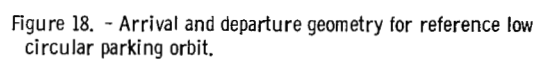


Figure 17. - Symmetric round-trip geometry.



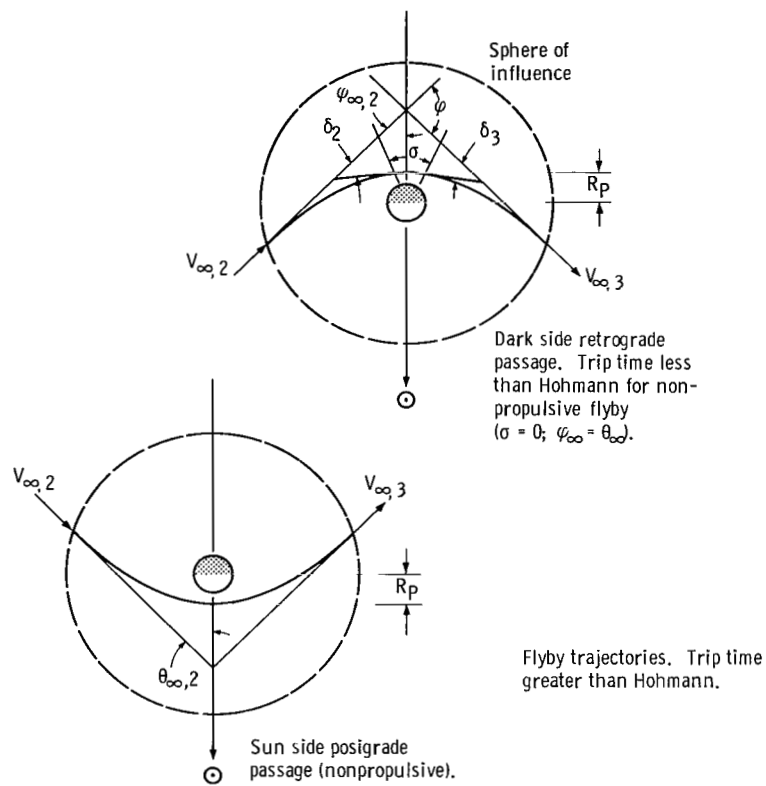


Figure 20. - Target planet passage for symmetric flyby round trip.

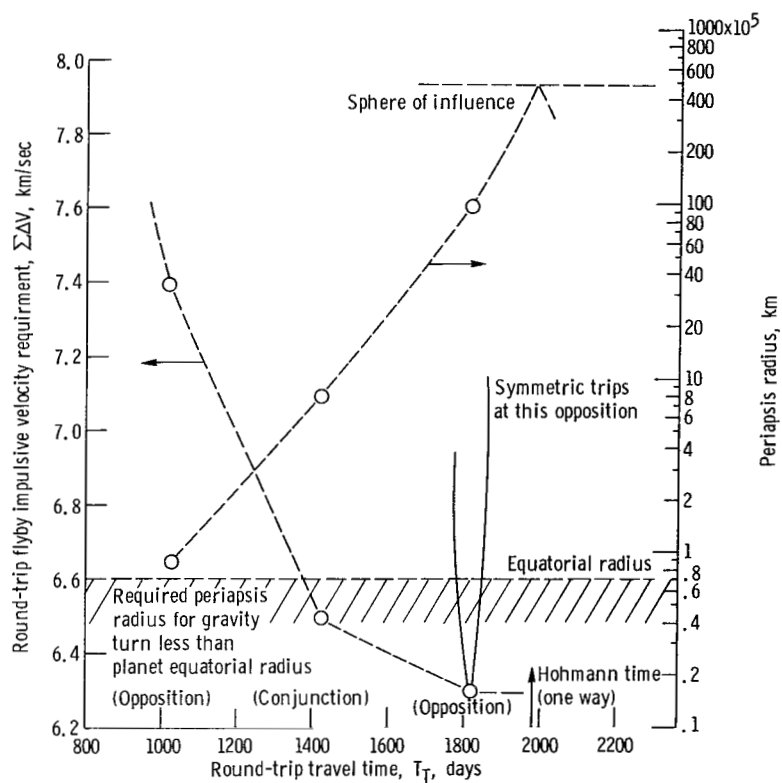


Figure 21. - Round-trip impulsive velocity requirement and periapsis radius for symmetric nonpropulsive flyby round trip to Jupiter with atmospheric braking at Earth return.



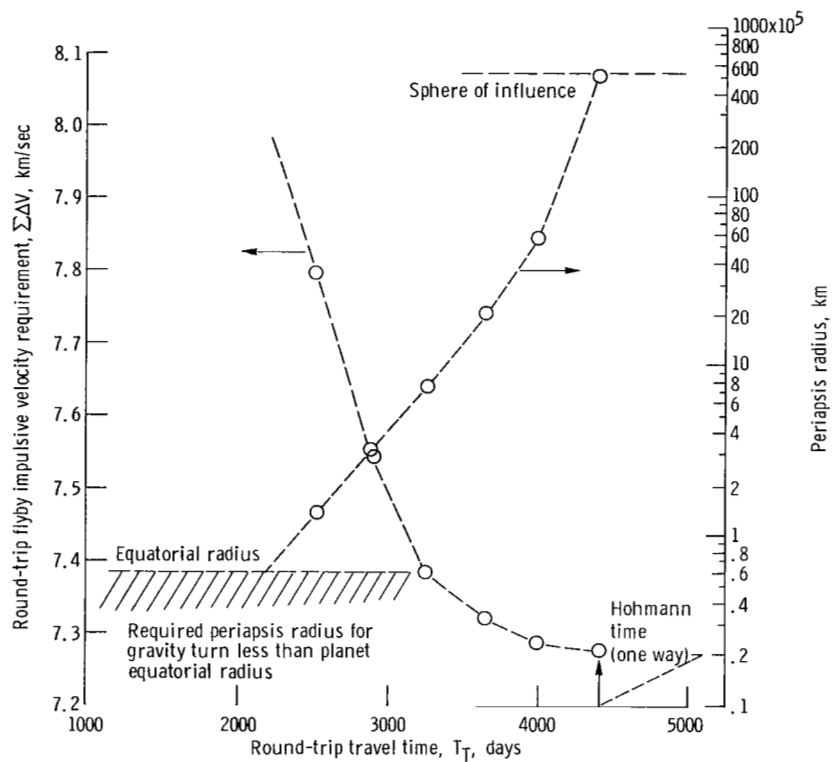


Figure 22. - Round-trip impulsive velocity requirement and periapsis radius for symmetric nonpropulsive flyby round trip to Saturn with atmospheric braking at Earth return.

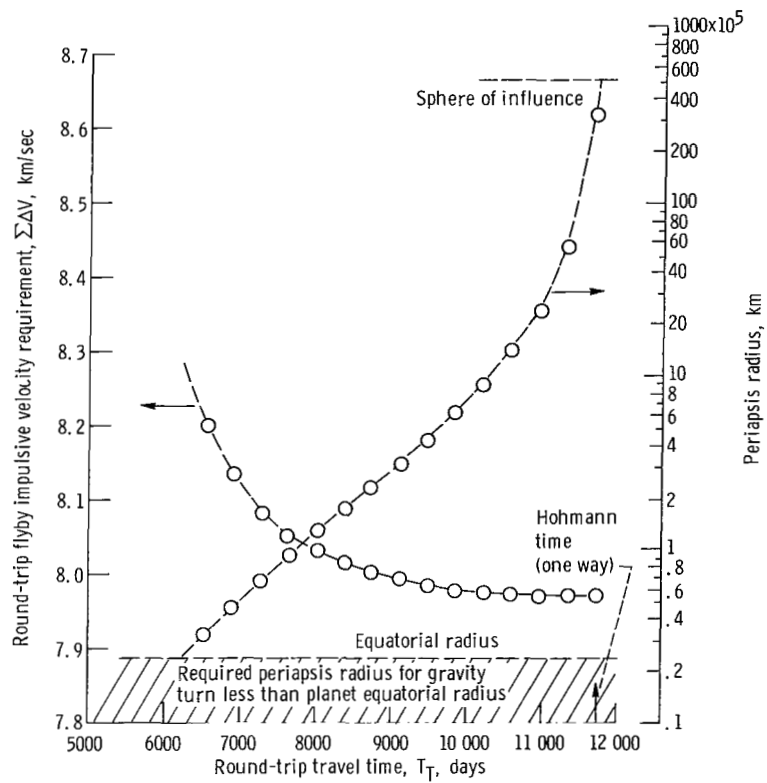


Figure 23. - Round-trip impulsive velocity requirement and periapsis radius for symmetric nonpropulsive flyby round trip to Uranus with atmospheric braking at Earth return.

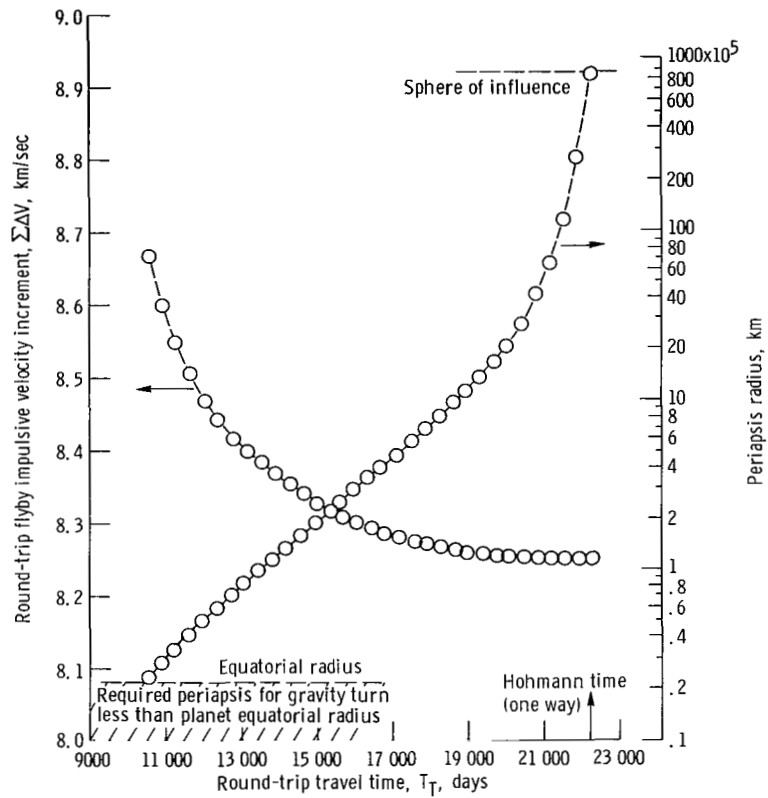


Figure 24. - Round-trip impulsive velocity requirement and periapsis radius for symmetric nonpropulsive flyby round trips to Neptune with atmospheric braking at Earth return.

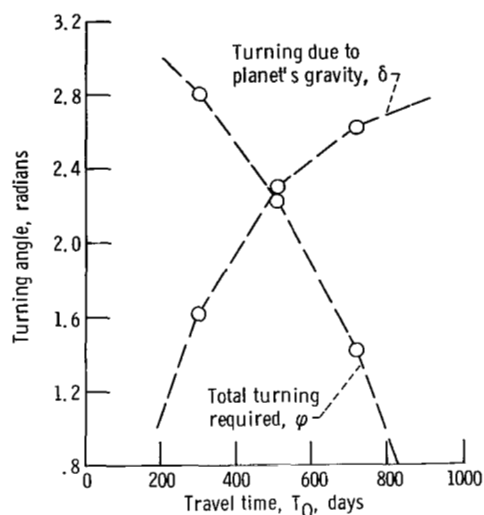


Figure 25. - Variation of total required turning and gravity turning obtained with transfer time for minimum  $\Delta V$  Earth to Jupiter trajectories with periapsis at 1.1 planet radii. (Turning required from parking orbit,  $\sigma = \phi - \delta$ .)

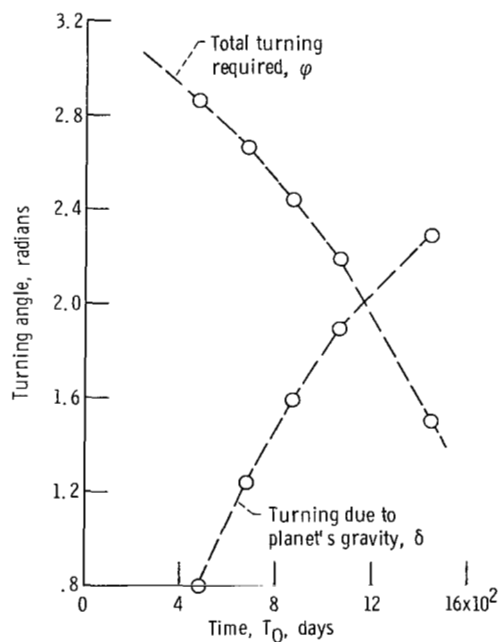


Figure 26. - Variation of total required turning and gravity turning obtained with transfer time for minimum  $\Delta V$  Earth to Saturn trajectories with periapsis at 1.1 planet radii. (Turning required from parking orbit,  $\sigma = \phi - \delta$ .)

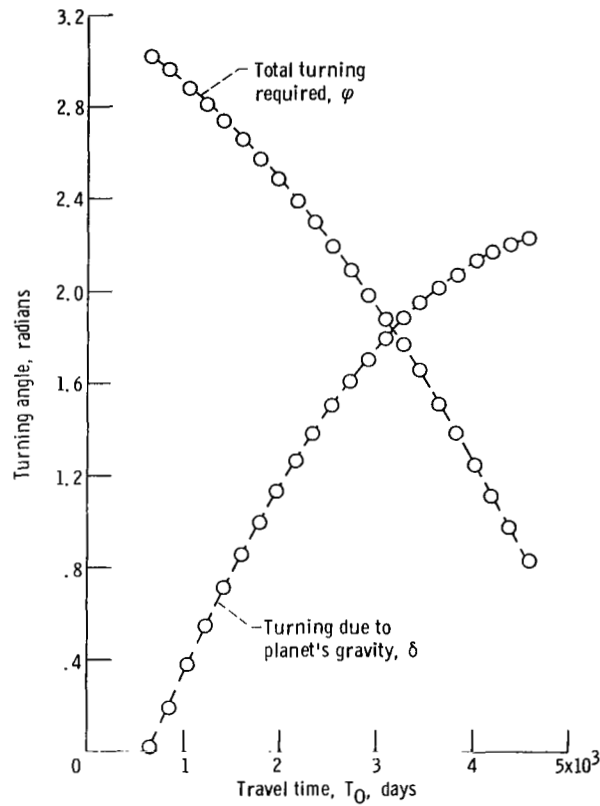


Figure 27. - Variation of total required turning and gravity turning obtained with transfer time for minimum  $\Delta V$  Earth to Uranus trajectories with periapsis at 1.1 planet radii. (Turning required from parking orbit,  $\sigma = \phi - \delta$ .)

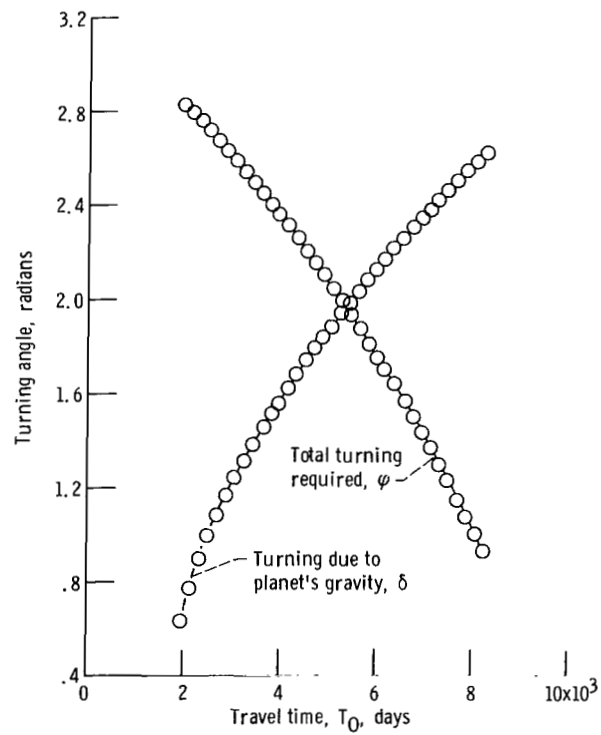


Figure 28. - Variation of total required turning and gravity turning obtained with transfer time for minimum  $\Delta V$  Earth to Neptune trajectories with periapsis at 1.1 planet radii. (Turning required from parking orbit,  $\sigma = \phi - \delta$ .)

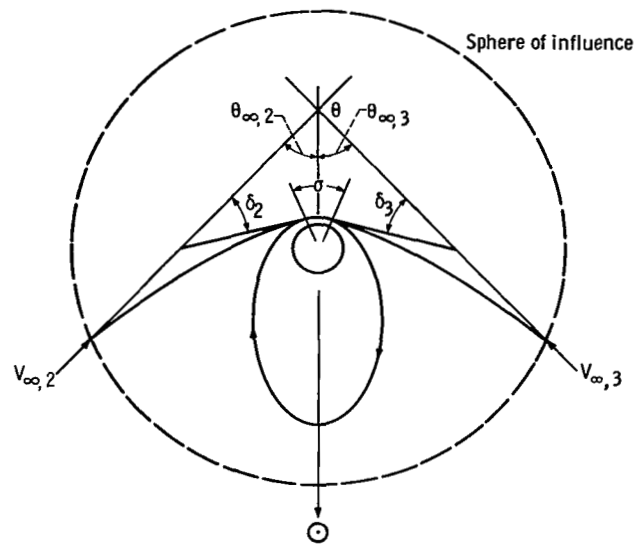


Figure 29. - Elliptic parking orbit for symmetric round-trip mission. Retrograde orbit; dark side periastron.

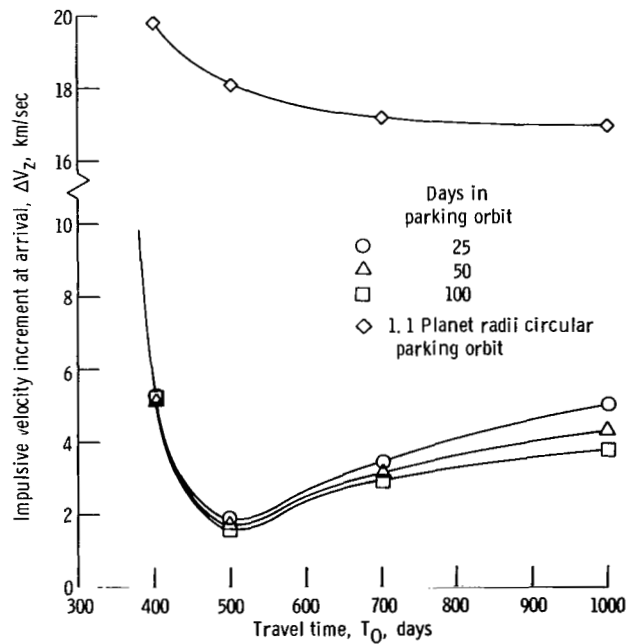


Figure 30. - Variation of impulsive velocity increment  $\Delta V$  at arrival for entry into elliptical parking orbits at Jupiter for symmetric round trips.

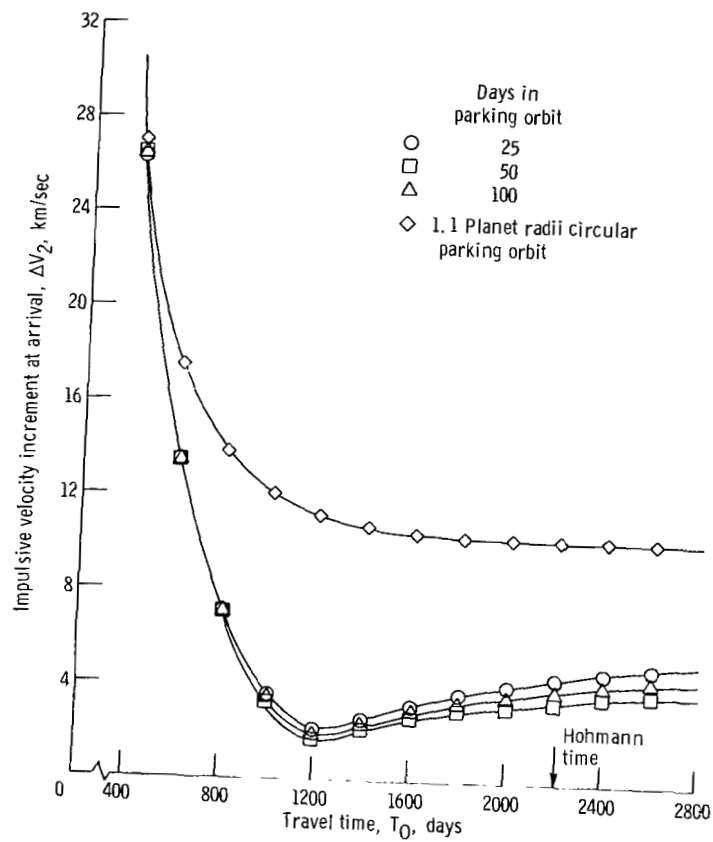


Figure 31. - Variation of impulsive velocity increment  $\Delta V$  at arrival for entry into elliptical parking orbits at Saturn for symmetrical round trips.



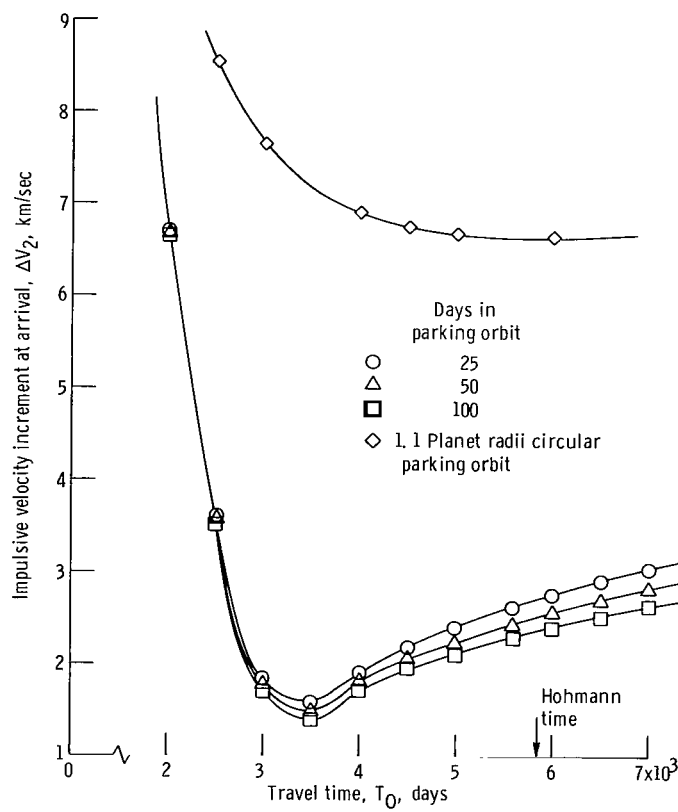


Figure 32. - Variation of  $\Delta V$  at arrival for entry into parking orbits at Uranus for symmetrical round trips.

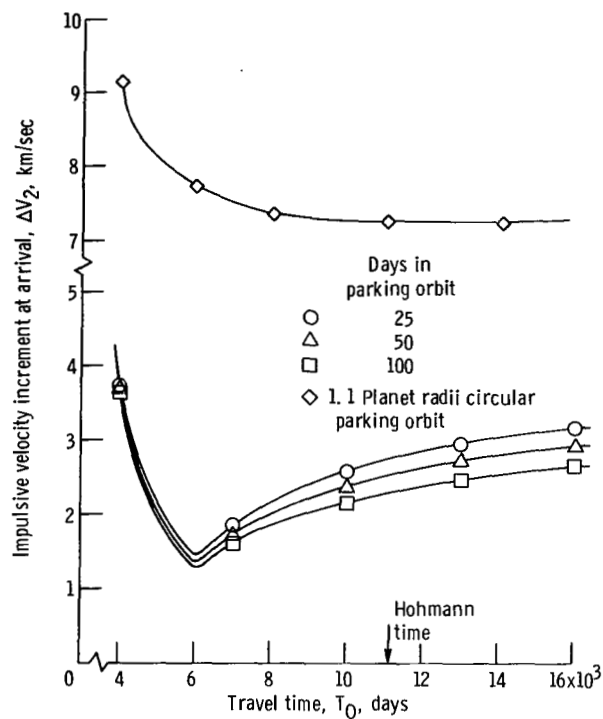


Figure 33. - Variation of  $\Delta V$  at arrival for entry into parking orbits at Neptune for symmetrical round trips.

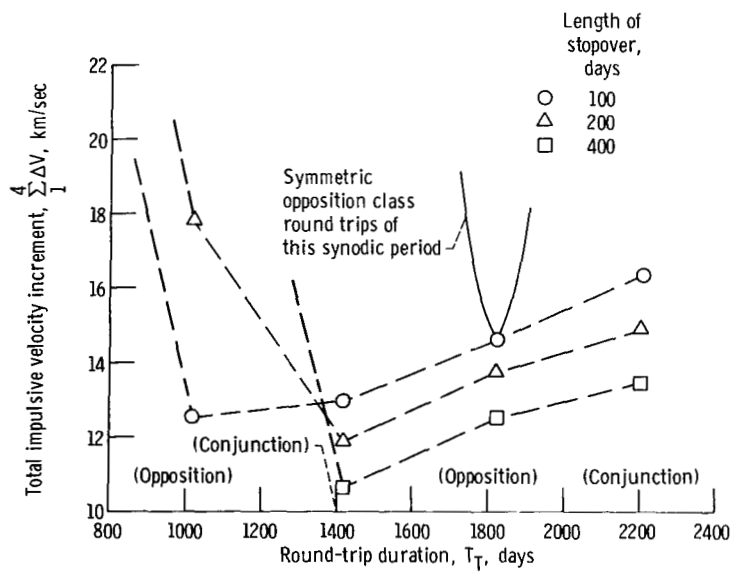


Figure 34. - Total impulsive velocity increment for symmetric stopover round trips to Jupiter with atmospheric braking at Earth return.

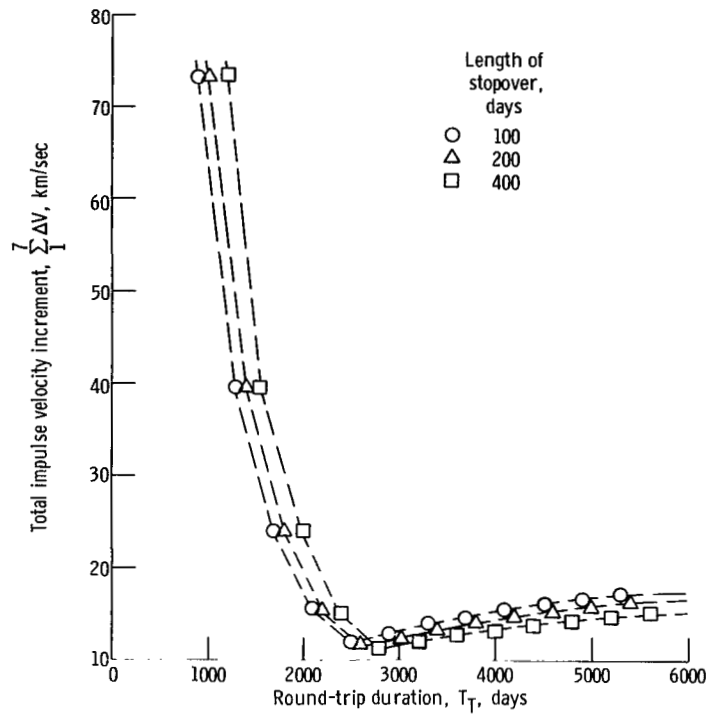


Figure 35. - Total impulsive velocity increment for symmetric stopover round trips to Saturn with atmospheric braking at Earth return.

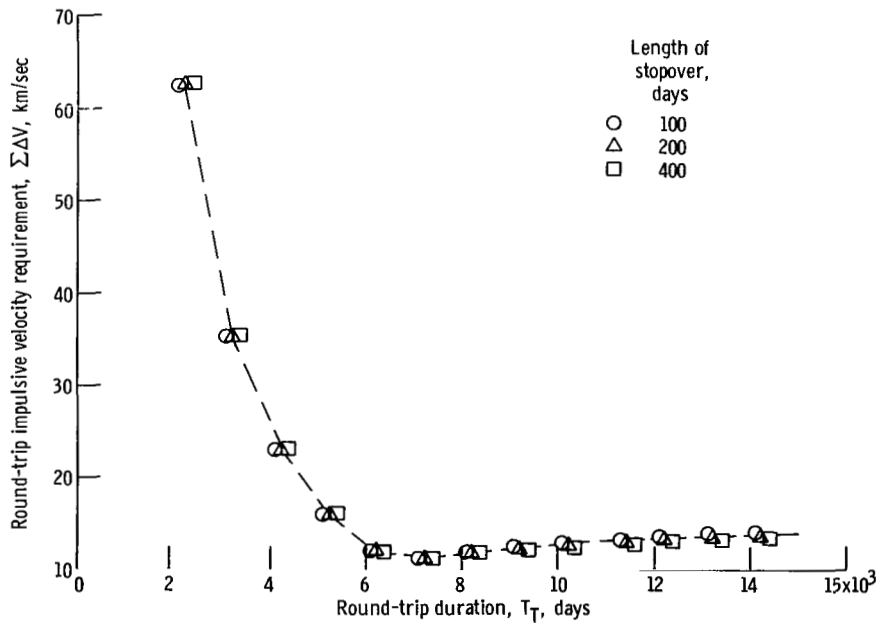


Figure 36. - Variation of  $\sum \Delta V$  with trip duration for symmetric stopover round-trip trajectories from Earth to Uranus with atmospheric braking at Earth return.

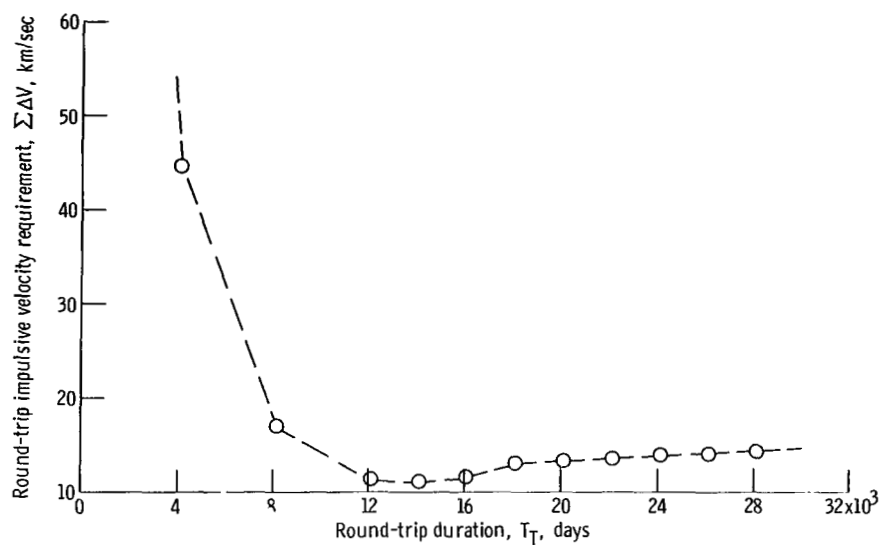


Figure 37. - Variation of  $\Sigma\Delta V$  with trip duration for symmetric stopover round-trip trajectories from Earth to Neptune with atmospheric braking at Earth return.

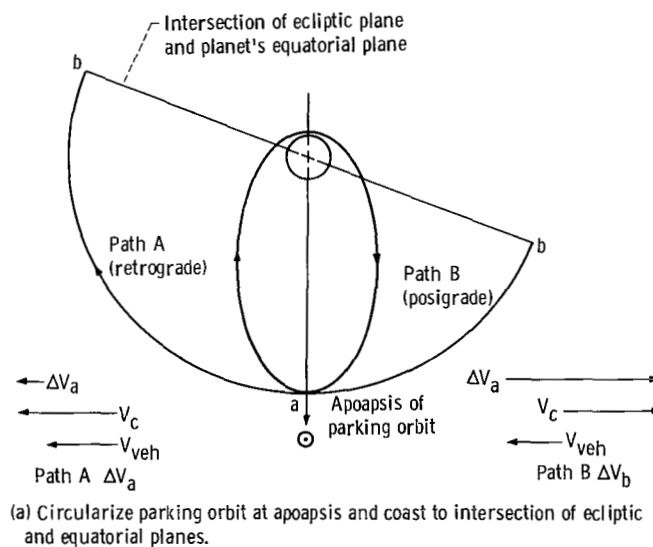
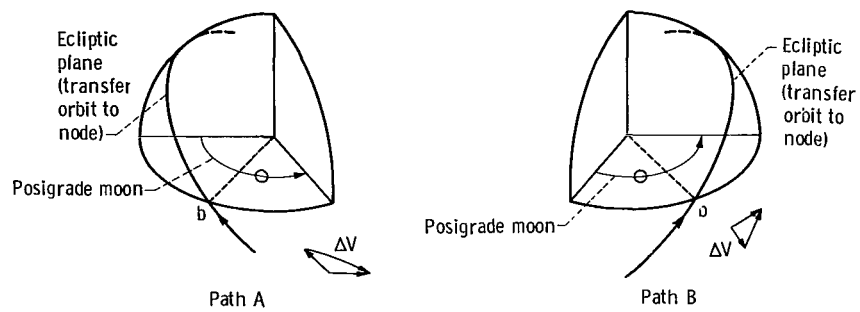
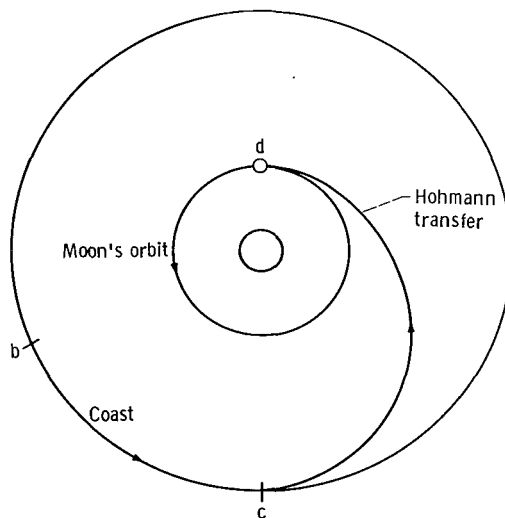


Figure 38. - Interlunar trajectories - transfer from parking orbit to first moon.



(b) Transfer from ecliptic plane to equatorial plane from retrograde orbit (path A) or posigrade orbit (path B) into posigrade circular orbit.



(c) Posigrade Hohmann transfer to posigrade target moon following coast from intersection of ecliptic and equatorial planes.

Figure 38. - Concluded.

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